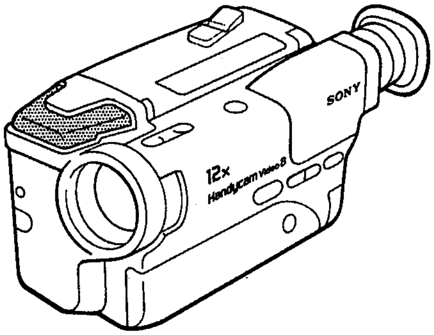
CCD-TR23/TR33/TR380/
TR380PK/TR460/TR460PK
RMT-708

SERVICE MANUAL

US Model
Canadian Model
CCD-TR23/TR33
E Model
CCD-TR380/TR380PK/TR460/TR460PK
Hong Kong Model
CCD-TR380/TR460



Handycam

A MECHANISM

CCD-TR380PK is model that carrying case and wireless remote commander are added in CCD-TR380.
CCD-TR480PK is model that carring case are added in CCD-TR480.
CCD-TR380PK/TR460PK are different from CCD-TR380/TR460 only in the accessory and packing materials.

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

SPECIFICATIONS

Video Camera Recorder

System

Video recording system
Two rotary heads, Helical scanning, FM system

Audio recording system
Rotary heads, FM system

Video signal
NTSC color, EIA standards

Usable cassette
8 mm video format cassette (standard 8 mm)

Tape speed
SP mode: Approx. 19/32 inches (1.43 cm)/second,
LP mode: Approx. 5/16 inches (0.72 cm)/second (playback only)

Recording time
SP mode 2 hours (P6-120)

Playback time
SP mode: 2 hours (P6-120)
LP mode: 4 hours (P6-120)

Fastforward/rewind time
Approx. 6 min. 30 sec. (P6-120)

Image devide
CCD (Charge Coupled Device)

Viewfinder
Electronic viewfinder
CCD-TR23/TR380: Black and white
CCD-TR33/TR460: Color

Lens
12 x,Combined power zoom lens, Filter diameter 1½ inches (37 mm), TTL autofocus system inner focus wide macro system

Focal distance
7/32–2⅝ in (5.4–64.8 mm)
1 9/16–18½ in (39–468 mm), when converted into a 35-mm still camera

Color temperature
Auto

Minimum illumination
0.8 lx at F1.8

Illumination range
0.8 – 100,000 lx

Recommended illumination
More than 100 lx

Output connector

Video output
Phono jack, 1 Vp-p, 75 Ω, unbalanced, sync negative

Audio output
Monaural, Phono jack 327 mV, (at output impedance 47 kΩ)
impedance less than 2.2 kΩ

RFU DC OUT
Special minijack, DC 5 V

Earphone jack
Minijack (ø3.5 mm)

LANC jack
Stereo mini-minijack (ø 2.5 mm)

MIC jack
Minijack, 0.388 mV low impedance with 2.5 to 3 V DC, output impedance 6.8 kΩ (ø3.5 mm)

– **Continued on next page** –

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

General

Power requirements
On battery mounting surface 6.0 V (battery pack), 7.5 V (AC power adaptor)

Average power consumption
CCD-TR23/TR380: 4.9 W
CCD-TR33/TR460: 5.2 W
Camera recording, including the viewfinder

Installation
Vertically, Horizontally

Operating temperature
32°F to 104°F (0°C to 40°C)

Storage temperature
-4°F to +140°F (-20°C to +60°C)

Dimensions
4½ x 4⅜ x 8¼ inches (w/h/d)
(114 x 110 x 207 mm)

Mass
Excluding the battery pack, lithium battery, cassette, and shoulder strap
CCD-TR23/TR380: 1 lb 14 oz (850 g)
CCD-TR33/TR460: 1 lb 13 oz (840 g),
Including the battery pack NP-55, lithium battery CR2025, cassette P6-120, and shoulder strap
CCD-TR23/TR380: 2 lb 6 oz (1,070 g)
CCD-TR33/TR460: 2 lb 5 oz (1,060 g),

Microphone
Monaural, Electret condenser microphone

Supplied accessories
See page 1-1.

AC power adaptor

Power requirements
110 – 240 V AC*, 50/60 Hz

Power consumption
AC-V25A/V25B: 17 W
AC-V25C: 18 W

Output voltage
DC OUT in operating mode:
AC-V25A/V25B: 7.5 V, 1.5A
AC-V25C: 7.5 V, 1.6 A
Battery charge terminal: 10 V, 1.1 A in charge mode

Application
Sony battery packs NP-55, NP-60D, NP-66H, NP-77H, NP-80/80D, NP-68, NP-C65

Operating temperature: 32°F to 104°F (0°C to 40°C)

Storage temperature: -4°F to +140°F (-20°C to +60°C)

Dimensions: Approx. 4⅛ x $1\frac{15}{16}$ x 2½ inches (103 x 49 x 63 mm) including projecting parts and controls

Mass:
AC-V25A: 11 oz (320 g)
AC-V25B/V25C: 10 oz (300 g)

* Canadian Standard Association (CSA) certifies 120 V AC only.

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

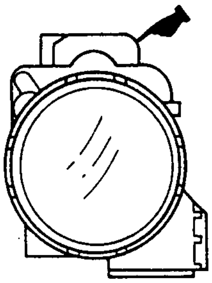
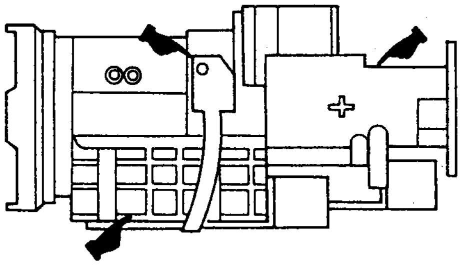
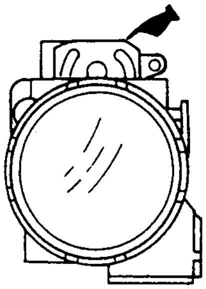
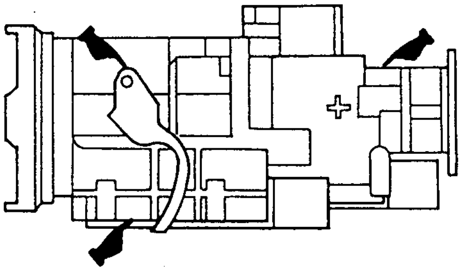
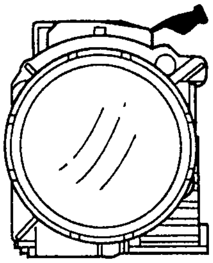
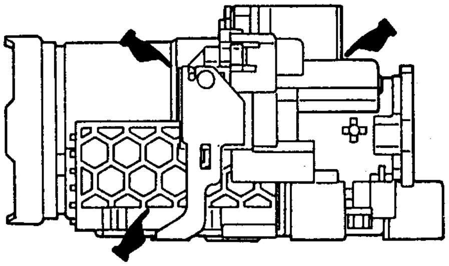
SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

[Zoom lens]

This unit employs three types of lens.
Note that the lenses are interchangeable, however their components are not.

Differentiating the lens ☛ : difference point

TYPE I (LSV-140A)	**TYPE II (VCL-5412WA)**
From the front of the lens  From the right side of the lens (as seen from the front) 	From the front of the lens  From the right side of the lens (as seen from the front) 
TYPE III (VCL-5412WB)	
From the front of the lens  From the right side of the lens (as seen from the front) 	

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There is the color reproduction standard frame at the back of the book.

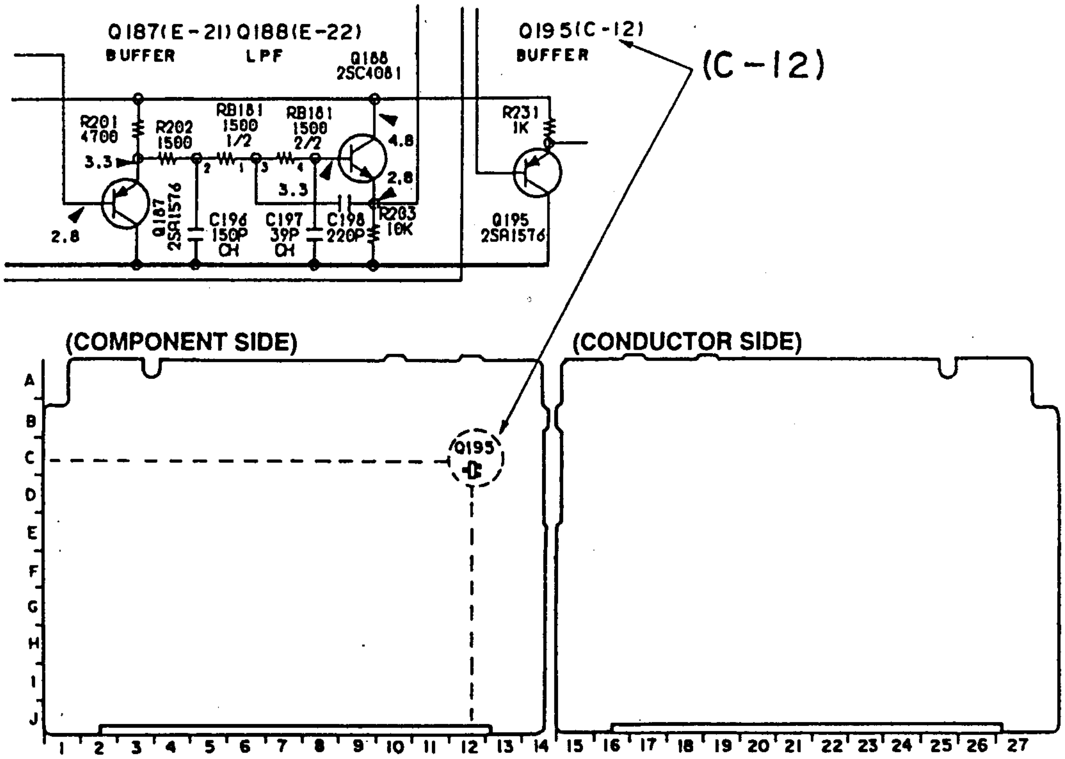
SERVICE NOTE

[ATTACH ADDRESS DISPLAY LOCATION OF ACTUAL SIZE]

In this manual, the mounted locations of all electrical parts in boards are mentioned in blank space of the printed wiring boards. The location display of actual size is attached under the color reproduction frame at the end of this service manual. It will be available if you take a copy of this to a clear sheet.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red in schematic diagrams. This enables to find the location on the board easily when servicing.


Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
4.8
3.3
3.3
2.8
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
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[HEAD CLEANING]

After an extended period of use the video image may become indistinet or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✖] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

SECTION 1
GENERAL

This section is extracted from CCD-TR23/TR33 instruction manual (Except Page 1–1).

Before You Begin

Checking Your Model Number

The instructions in this manual are for two models listed below. Before you start reading and operating, check your model number by looking at the bottom of your camcorder. The CCD-TR33 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "CCD-TR33".
As you read through this manual, buttons and settings on the camcorder are shown in capital letters.
e.g. Set the POWER switch to CAMERA.

Types of Differences

Model number	Viewfinder
CCD-TR23	B/W
CCD-TR33	Color

Note on TV Color Systems

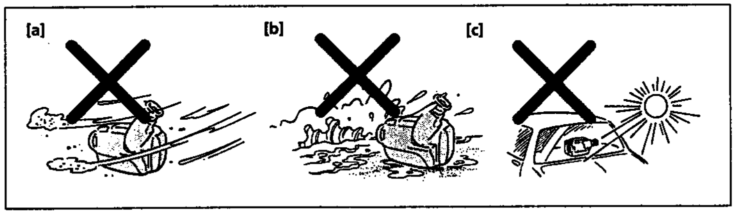
TV color systems differ from country to country.
To view your recordings on a TV, you need an NTSC system based TV. When you want to use a PAL-M system based TV, you will need a NTSC/PAL-M transcoder (as this is an NTSC system based camcorder). Please check the list on page 35 to see the TV color system of your country.

Precaution on Copyright

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

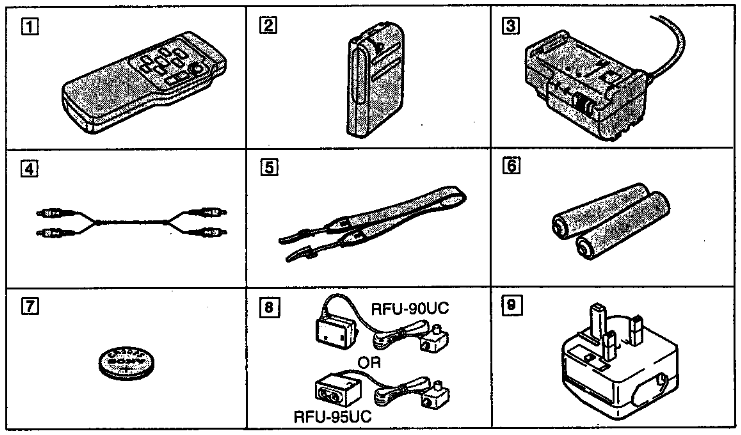
Precautions on Camcorder Care

- **Do no let sand get into the camcorder. When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired. [a]**
- **Do not let the camcorder get wet. Keep the camcorder from rain or sea water. It may cause a malfunction and sometimes the malfunction cannot be repaired. [b]**
- Never leave the camcorder under temperatures above 140°F (60°C), such as in a car parked in the sun or under direct sunlight. [c]



Checking Supplied Accessories

Check that the following accessories are supplied with your camcorder.



1 **Wireless remote commander (1) (Except TR380)**

2 **NP-55 Battery pack (1)**

3 **AC-V25A/V25B/V25C AC power adaptor (1)**

4 **A/V connecting cable (1)**

5 **Shoulder strap (1)**

6 **Size AA (R16) Battery for Remote Commander (2) (Except TR380)**

7 **CR2025 Lithium Battery (1)**
Already installed in the camcorder.

8 **RFU-90UC/95UC RFU adaptor (1) (E, Hong Kong Models)**

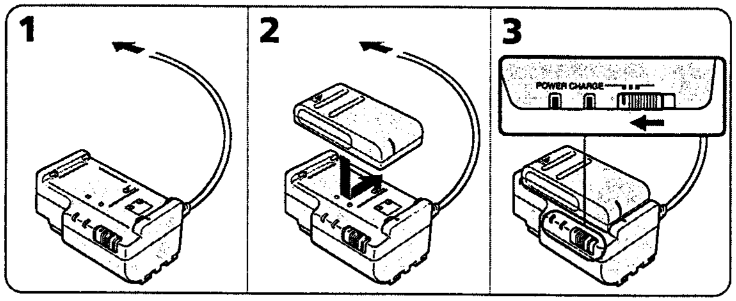
9 **AC CONVERSION ADAPTOR (1) (Hong Kong Model)**

Charging and Installing the Battery Pack

Before using your camcorder, you first need to charge and install the battery pack. To charge the battery pack, use the supplied AC-V25A/V25B/V25C AC power adaptor.

Charging the Battery Pack

Charge the battery pack on a flat place without vibration.
(1) Connect the AC power adaptor to a wall outlet. **(2)** Align the right side of the battery pack with the line on the AC power adaptor, then slide the battery pack in the direction of the arrow. **(3)** Set the selector to CHARGE. The POWER lamp (green) and the CHARGE lamp (orange) light up. Charging begins.
When charging is completed, the CHARGE lamp goes out. Set the selector to the center position and unplug the unit from the wall outlet. Then remove the battery pack and install it on the camcorder. To stop charging, set the selector to the center position.



Charging Time

Battery pack	NP-55 (supplied)	NP-80 NP-80D	NP-77H	NP-66H NP-68	NP-60D	NP-C65
Charging time*	70	190	170	125	90	105

* Approximate minutes to charge an empty pack using the AC-V25A/V25B/V25C (Lower temperatures require a longer charging time.)

Battery Life

CCD-TR23

Battery pack	NP-55	NP-80 NP-80D	NP-77H	NP-66H NP-68	NP-60D	NP-C65
Typical recording time**	30	90	85	60	45	50
Continuous recording time ***	65	170	165	120	85	95

CCD-TR33

Battery pack	NP-55	NP-80 NP-80D	NP-77H	NP-66H NP-68	NP-60D	NP-C65
Typical recording time**	30	85	80	60	40	45
Continuous recording time ***	60	165	155	115	80	90

** Approximate minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.
*** Approximate continuous recording time indoors.

Important!

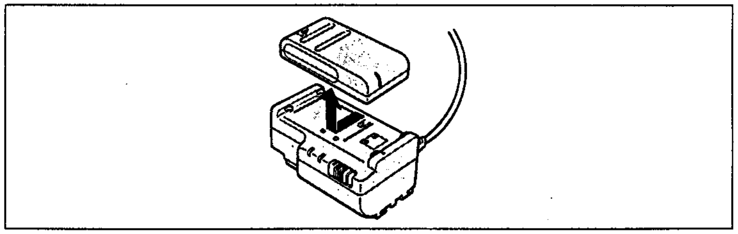
Use the battery completely before re-charging!

Before you recharge the battery, make sure the battery has been used up (discharged) completely. Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.

To use up the battery, remove the cassette and slide the POWER switch to CAMERA with the battery attached, and leave the camcorder until the ⌧ indicator and the red lamp flash rapidly in the viewfinder.

Removing the Battery Pack

Slide the battery pack in the direction of the arrow.

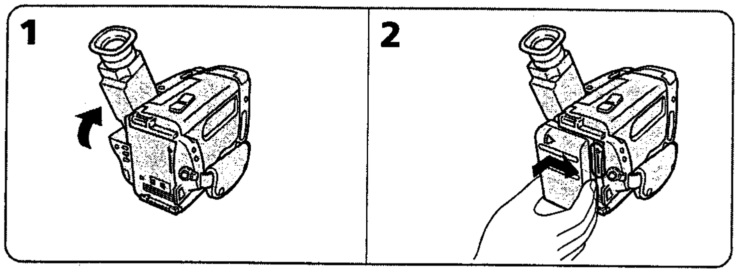


Notes on charging the battery pack
- The POWER lamp will remain lit for a while even if the battery pack is removed and the power cord is unplugged after charging the battery pack. This is normal.
- If the POWER lamp does not light, set the selector to the center position and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to CHARGE again.
- You cannot operate the camcorder using the AC power adaptor while charging the battery pack.

Charging and Installing the Battery Pack

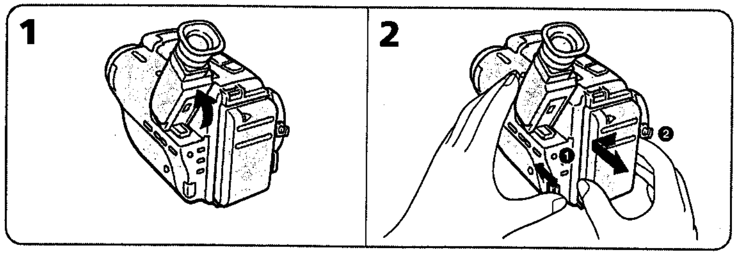
Installing the Battery Pack

(1) Lift up the viewfinder. **(2)** Align the right side of the battery pack with the white line on the camcorder, and slide the battery pack to the right.



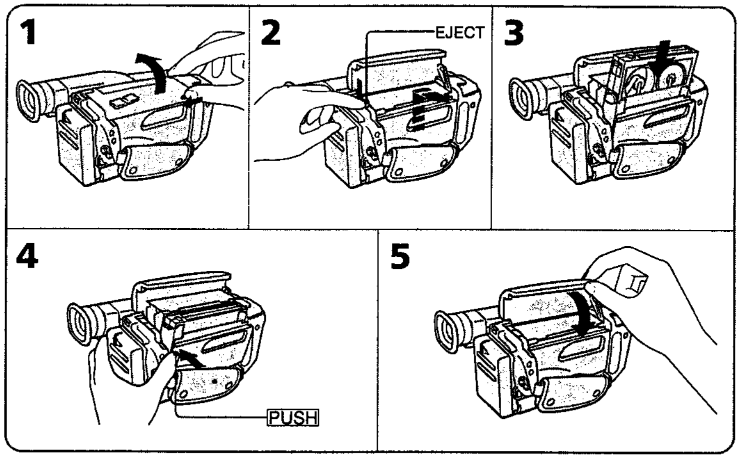
Removing the Battery Pack

(1) Lift up the viewfinder. **(2)** While pressing BATT, slide the battery pack to the left.



Inserting a Cassette

Make sure that a power source is installed.
(1) While sliding the lid lock, lift up the lid. Then open it. **(2)** Press EJECT. The cassette compartment automatically lifts up and opens. **(3)** Insert a cassette (not supplied) with the window facing out.
(4) Press the PUSH mark on the cassette compartment to close it. The cassette compartment automatically goes down. **(5)** Close the lid until it locks.

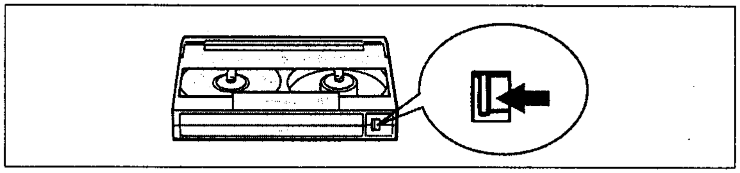


To Eject the Cassette

Press EJECT.

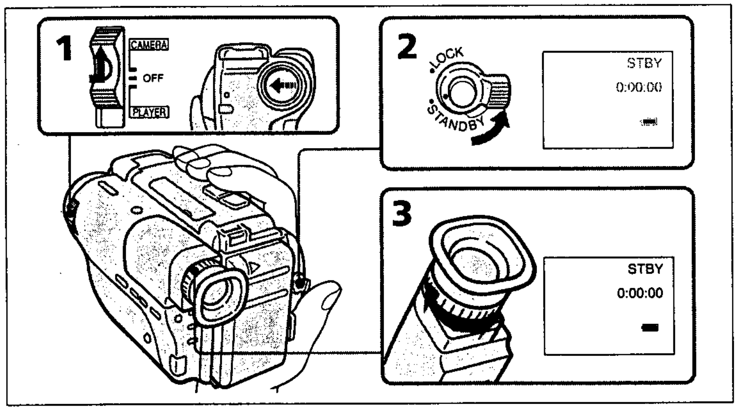
To Prevent Accidental Erasure

Slide the tab on the cassette to expose the red mark.
If you try to record with the red mark exposed, the 📼 and ⏏ indicators flash in the viewfinder, and you cannot record on the tape. To re-record on this tape, slide the tab back out to cover the red mark.



Adjusting the Viewfinder Lens

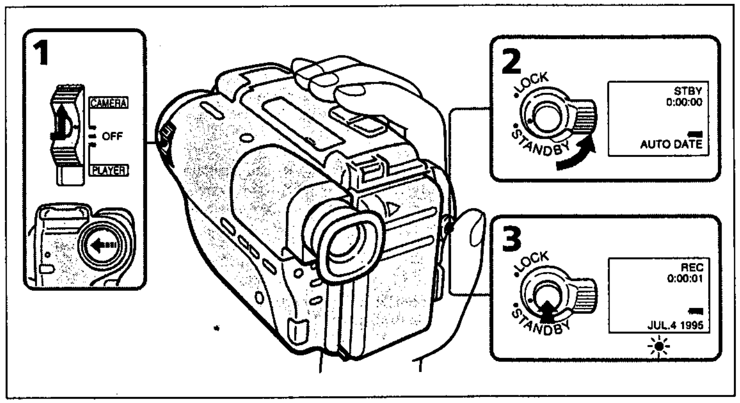
Before you use the camcorder for the first time or after someone else has used it, focus the viewfinder lens. Make sure that the power source is connected to the camcorder.
(1) While pressing the small green button on the POWER switch, slide it to CAMERA. **(2)** Turn STANDBY up. **(3)** Turn the viewfinder lens adjustment ring so that the indicators in the viewfinder come into sharp focus.


1
CAMERA
OFF
PLAYER
2
LOCK
STANDBY
STBY
0:00:00
3
STBY
0:00:00

Basic Operations

Camera Recording

Make sure that a power source and a cassette is inserted. The date is automatically recorded for 10 seconds after you start recording (AUTO DATE feature). This feature works only once a day. Before you record one-time events, you may want to make a trial recording to make sure that you are using the camcorder correctly.
(1) While pressing the small green button on the POWER switch, slide it to CAMERA. **(2)** Turn STANDBY up. **(3)** Press START/STOP. The camcorder starts recording and the "REC" indicator apperars in the viewfinder.

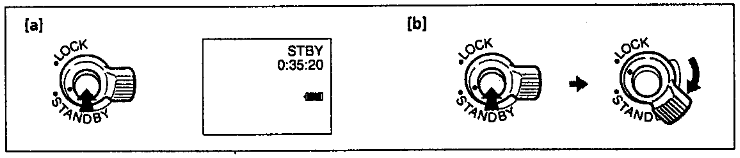

1
CAMERA
OFF
PLAYER
2
LOCK
STANDBY
STBY
0:00:00
AUTO DATE
3
LOCK
STANDBY
REC
0:00:01
JUL.4 1995

To Stop Recording Momentarily [a]

Press START/STOP again. The "STBY" indicator appears in the viewfinder (**Standby mode**).

To Finish Recording [b]

Press START/STOP. Turn STANDBY down, and set the POWER switch to OFF.
Then, eject the cassette (p. 9) and remove the battery (p. 8).


[a]
LOCK
STANDBY
STBY
0:35:20
[b]
LOCK
STANDBY
LOCK
STANDBY

See the next page for further information.

Note on Standby mode
If you leave the camcorder for 5 minutes or more with a cassette inserted in Standby mode, the camcorder goes off automatically. This prevents wearing down the battery and wearing out the tape. To resume Standby mode, turn STANDBY down once and turn it up again. To start recording, press START/STOP.

Note on recording
When you record from the beginning of the tape, run the tape for about 15 seconds before actual recording. This prevents the camcorder from missing any start-up scenes when you play back the tape. You can record tapes in SP (standard play) mode only.

Note on the tape counter
The tape counter indicates the recording or playback time. Use it as a guide. There will be a time lag of several seconds from the actual time. To set the counter to zero, press COUNTER RESET located below the viewfinder. You can know the approximate remaining tape by the remaining tape indicator (p. 45).

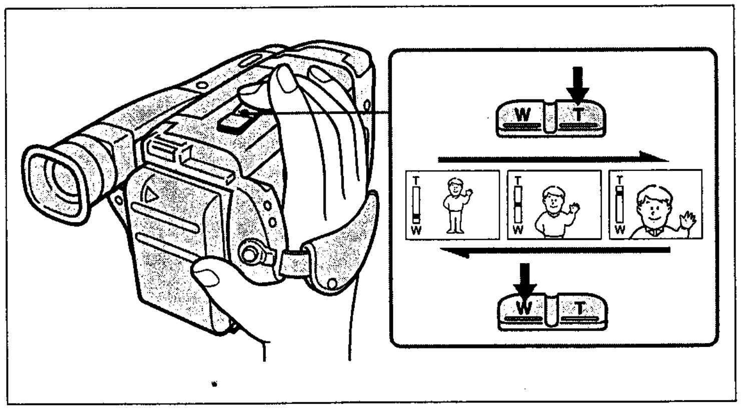
Note on the AUTO DATE feature
The clock is set to the East Coast Standard Time at the factory. You can reset the clock (p. 28).
You can change the AUTO DATE setting by selecting ON or OFF in the menu system (p. 25).

- The AUTO DATE feature works once a day. However, the date may automatically appear more than once a day when:
  - you reset the date and time.
  - you eject and insert the tape again.
  - you stop recording within 10 seconds.
  - you set AUTO DATE to OFF once and set to ON in the menu system.
- Once the AUTO DATE feature turns off the date display 10 seconds after the start of recording, the date and time are displayed as follows:
  - if the date display setting has been made, the date is displayed.
  - if the time display setting has been made, the time is displayed.
  - if neither display setting has been made, nothing is displayed.

When moving from indoors to outdoors (or vice versa)
Turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

Using the Zoom Feature

Zooming is a recording technique that lets you change the size of the subject in the scene. For more professional-looking recordings, use the zoom sparingly.
T side: for telephoto (subject appears closer)
W side: for wide-angle (subject appears farther away)



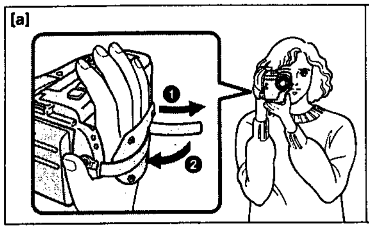
Zooming Speed
Press the power zoom button firmly for a high-speed zoom. Press it softly for a relatively slow zoom.

When you shoot a subject using a telephoto zoom
If you cannot get a sharp focus while in extreme telephoto zoom, press the W side of the power zoom button until the focus is sharp.
You can shoot a subject that is at least 3.3 feet (about 1 m) away from the lens surface in the telephoto position, or 1/2 inches (about 1cm) in the wide-angle position.

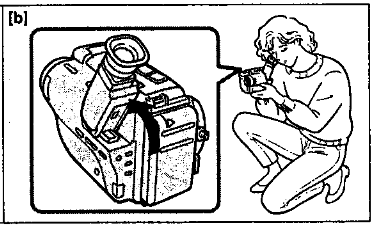
Hints for Better Shooting

For hand-held shots, you'll get better results holding the camcorder according to the following suggestions:

[a]



[b]



- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb. **[a]**
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Turn the viewfinder up for recording from a low position. **[b]**

Place the camcorder on a flat surface or use a tripod.
Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder (p. 41). Make sure the tripod screw is shorter than 9/32 in (6.5mm).

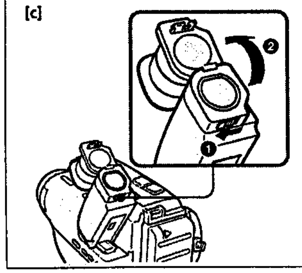
To Use the Viewfinder as a Sports Finder [c]

With the sports finder, you can monitor the picture while your eye is at a distance from the eyecup.
The sports finder is convenient when moving around to shoot scenes.
While sliding the viewfinder release knob to the left, flip open the viewfinder.

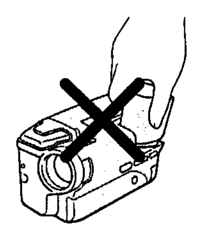
Note on the color viewfinder (for CCD-TR33 only)
You may find it difficult to use the color viewfinder as the sports finder for recording in light location.

Cautions on the viewfinder
- Do not pick up the camcorder by the viewfinder. **[d]**
- Do not place the camcorder so as to point the viewfinder toward the sun. The inside of the viewfinder may be deformed. Be careful in placing the camcorder under sunlight or at the window. **[e]**

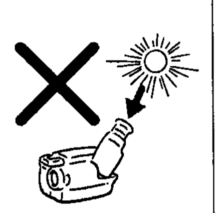
[c]



[d]

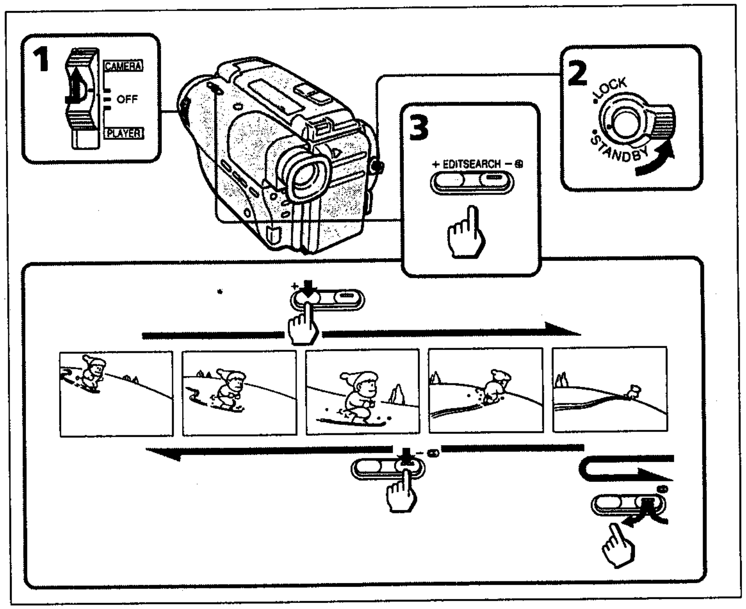


[e]



Checking the Recorded Picture

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.
(1) While pressing the small green button on the POWER switch, slide it to CAMERA.
(2) Turn STANDBY up. **(3)** Press EDITSEARCH. Press the – (⊜) side momentarily, the last few seconds of the recorded portion plays back **(Rec Review)**.
Keep pressing EDITSEARCH to play back the last recorded portion **(Edit Search)**.
+ side: to view the forward playback picture
- side: to view the reverse playback picture



To Stop Playback

Release EDITSEARCH.

To Begin Re-recording

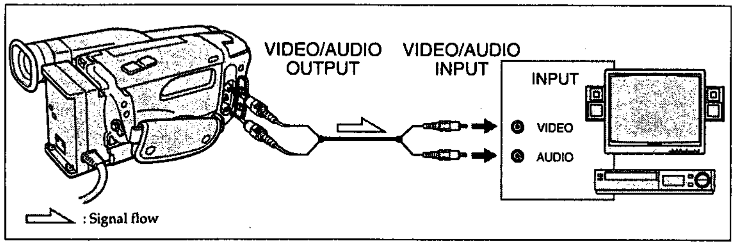
Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the tape, the transition between the last scene you recorded and the next scene you record will be smooth.

Monitoring the Sound While Viewing the Playback Picture in the Viewfinder

Connect an earphone (not supplied) to the ◎ jack. Play back the tape in PLAYER mode (p. 17).

Connections for Playback

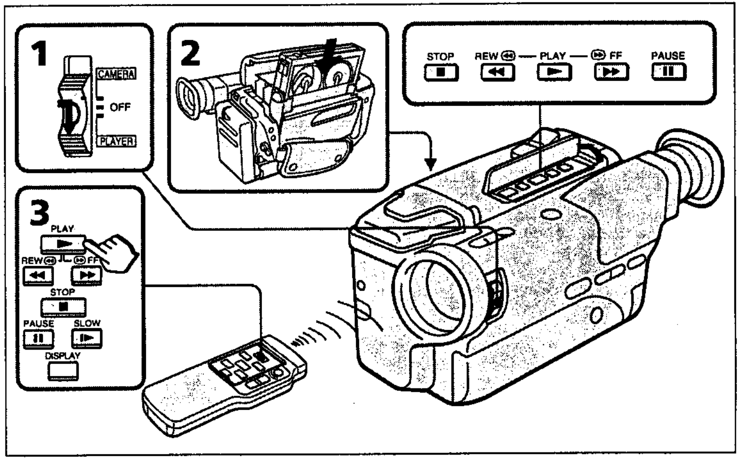
You can use this camcorder as a VCR by connecting it to your TV for playback. It is recommended to use the house current as the power source (p. 19).
Connect the camcorder to your TV by using the supplied A/V connecting cable. Set the TV/VCR selector to VCR on the TV. When connecting the camcorder to VCR, set the input selector on the VCR to LINE.


VIDEO/AUDIO OUTPUT
VIDEO/AUDIO INPUT
INPUT
VIDEO
AUDIO
: Signal flow

To connect a TV or a VCR without Video/Audio input jacks
Use the RFU-95UC RFU adaptor (not supplied).

Playing Back a Tape

You can monitor the playback picture in the viewfinder. You can also monitor on the TV screen, after connecting the camcorder to the TV/VCR. You can control playback using the supplied Remote Commander (p.43).
(1) While pressing the small green button on the POWER switch, slide it to PLAYER. **(2)** Insert the recorded tape with the window facing out. **(3)** Press ►. Playback starts.


1
CAMERA
OFF
PLAYER
2
STOP
REW
PLAY
FF
PAUSE
3
PLAY
REW
FF
STOP
PAUSE
SLOW
DISPLAY

To stop playback, press ■.
To rewind the tape, press ◄◄.
To advance the tape rapidly, press ►►.

See the next page for further information.

Playing Back a Tape

Various Playback Modes

To view a still picture (playback pause)
Press ❚❚ during playback. To resume playback, press ❚❚ or ▶.

To locate a scene (Picture Search)
Keep pressing ◀◀ or ▶▶ during playback. To resume normal playback, release the button.

To monitor the high-speed picture during fastforward or rewind (Skip Scan)
Keep pressing ◀◀ while rewinding or ▶▶ while advancing the tape. To resume normal playback, press ▶.

To view the picture in a sequence of stop-motion images
Press EDITSEARCH in playback pause mode. If you keep pressing EDITSEARCH, you can view the picture playback in the forward (+) or reverse (–) direction.

To view the picture at 1/5 speed (Slow Playback) (only with the Remote Commander)
Press ❙▶ on the Remote Commander during playback. To resume normal playback, press ▶. If slow playback lasts for about 1 minute, it shifts to normal speed automatically.

Note on playback
- Streaks appear and the sound is muted in the various playback modes.
- When still picture mode lasts for 5 minutes or more, the camcorder automatically enters stop mode.

To display the viewfinder screen indicators on the TV
Press DISPLAY on the Remote Commander.
To erase the indicators, press DISPLAY again.

Advanced Operations

Using Alternate Power Sources

You can choose any of the following power sources for your camcorder: battery pack (P.6), house current, and 12/24 V car battery. Choose the appropriate power source depending on where you want to use your camcorder.

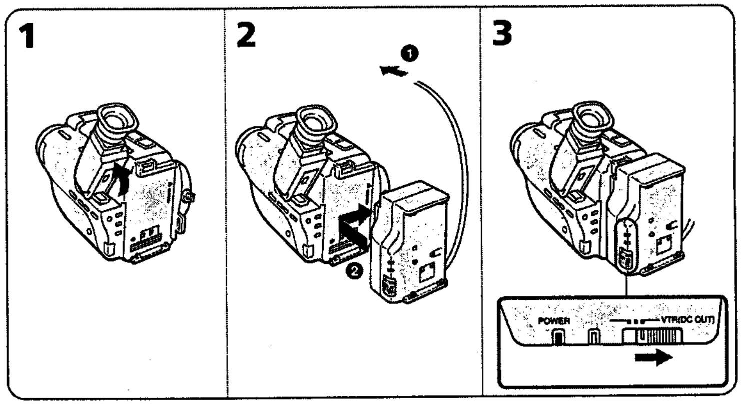
Place	Power sources	Accessory to be used
Indoors	House current	AC power adaptor AC-V25A/V25B/V25C (supplied), AC-S10, AC-V55
Outdoor	Battery pack	Battery pack NP-55 (supplied), NP-80/80D, NP-77H, NP-66H, NP-60D, NP-68, NP-C65
In the car	12 V or 24 V car battery	DC pack DCP-77

GENUINE VIDEO ACCY

This mark indicates that this product is a genuine product related to our 8mm video equipment. When purchasing our 8mm video equipment, we recommend that you purchase related 8mm video products provided with the same mark or products provided with our logotype mark.

Using House Current

To use the supplied AC-V25A/V25B/V25C AC power adaptor:
(1) Lift up the viewfinder. **(2)** Connect the AC power cord to a wall outlet. Connect the bottom of the AC power adaptor to the battery mounting surface of the camcorder. **(3)** Set the selector to VTR (DC OUT).



Notes on the POWER lamp
- The POWER lamp will remain lit for a while even if the unit is unplugged after use. This is normal.
- If the POWER lamp does not light, set the selector to the center position and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to VTR (DC OUT) again.

To remove the adapter
The adaptor is removed in the same way as the battery pack. (p.8)

Using Alternate Power Sources

Using a Car Battery

Use the DCP-77 DC pack (not supplied). Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V). Connect the DC pack to the battery mounting surface of the camcorder.

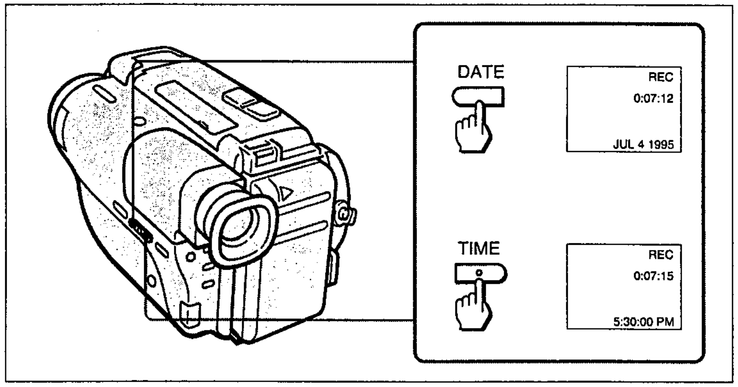
To remove the DC pack
The DC pack is removed in the same way as the battery pack. (p.8)

Options for Charging the Battery Pack

- AC-S10 AC power adaptor:
  You can charge a battery pack whether it is used up or not with this adaptor because it has a discharging function.
- BC-S10 portable battery charger (ideal for travel):
  You can charge a battery pack on 100 — 240 V AC current.

Recording with the Date or Time

Before you start recording, press DATE or TIME. You can record the date or time displayed in the viewfinder with the picture. You cannot record the date and time at the same time. Except for the date or time indicator, no indicator in the viewfinder is recorded.
The clock is set to the East Coast Standard Time at the factory.

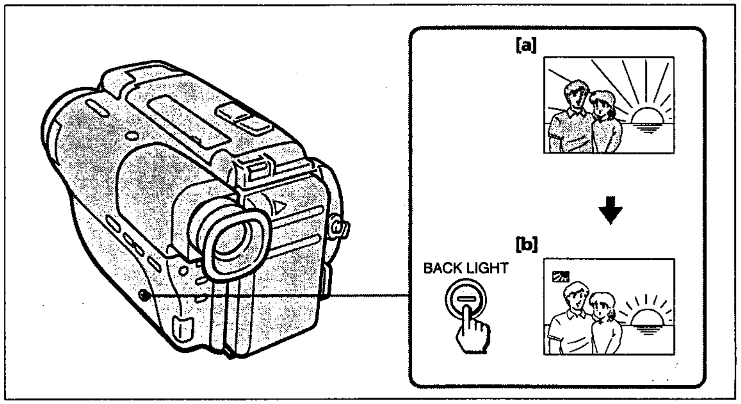


To Stop Recording with the Date or Time
Press DATE or TIME again. Recording continues.

Shooting with Backlighting

When you shoot a subject with the light source behind the subject or a subject with a light background, use the BACK LIGHT.

Press BACK LIGHT. The ▣ indicator appears inside the viewfinder.



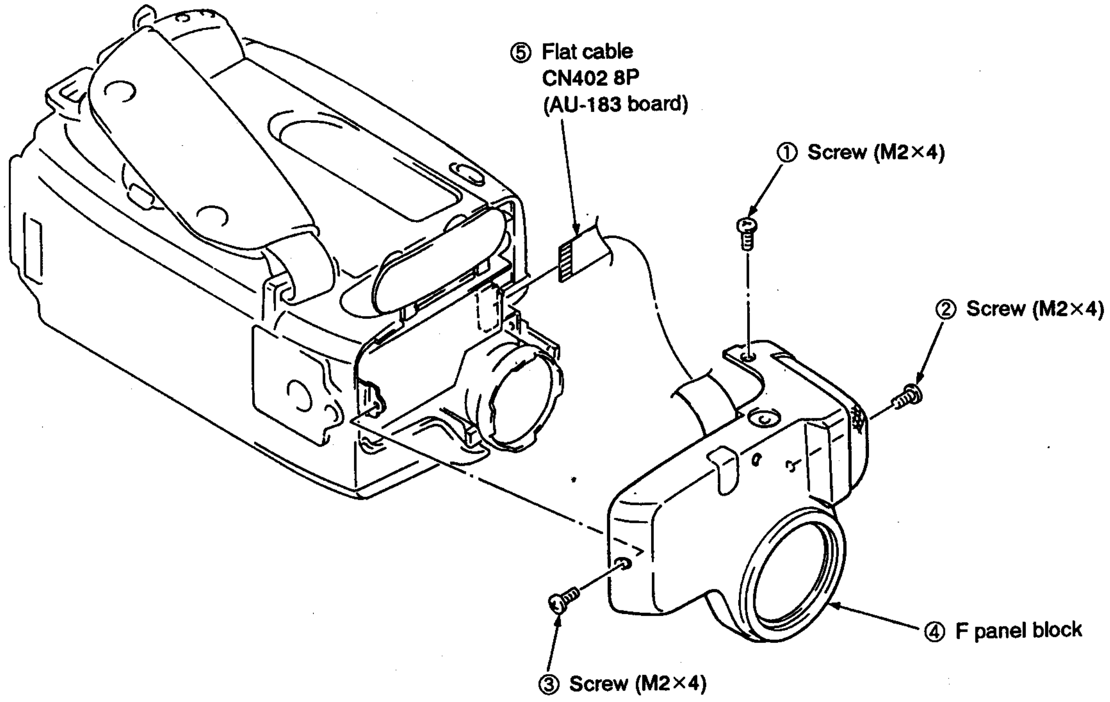
[a] Subject is too dark because of backlight.
[b] Subject becomes bright with backlight compensation.

After shooting
Press BACK LIGHT again to let the ▣ indicator go out under normal lighting condition. Otherwise, the picture will be too bright under normal lighting condition.

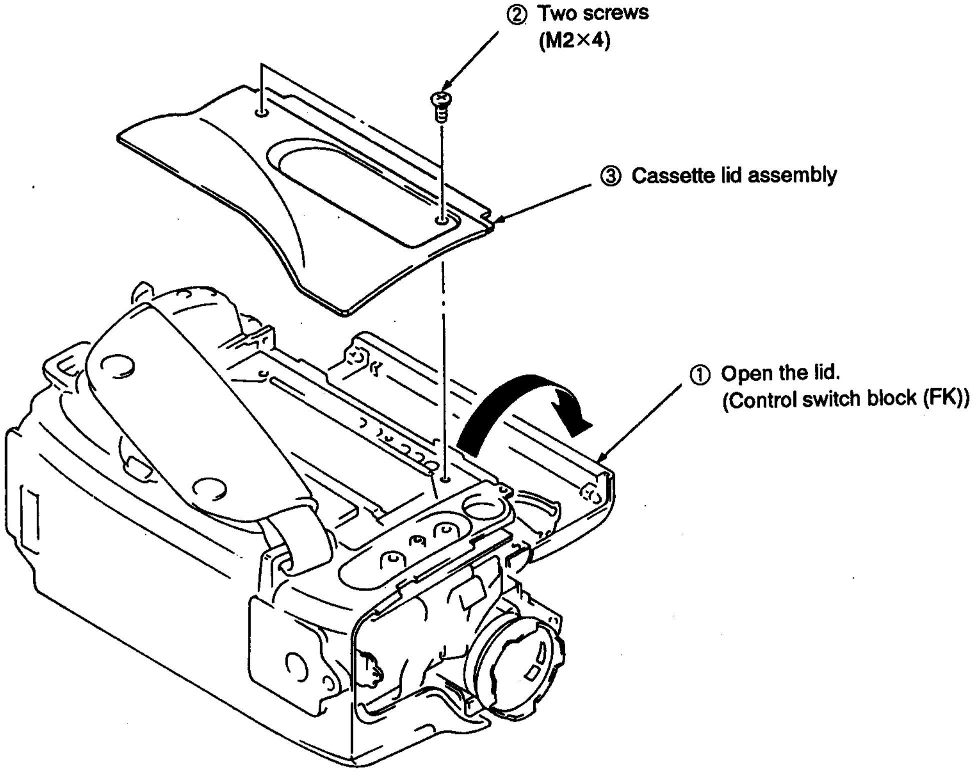
This function is also effective under following conditions:
- On the snow e.g. at the ski resort
- At the beach under strong sunshine
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF F PANEL BLOCK

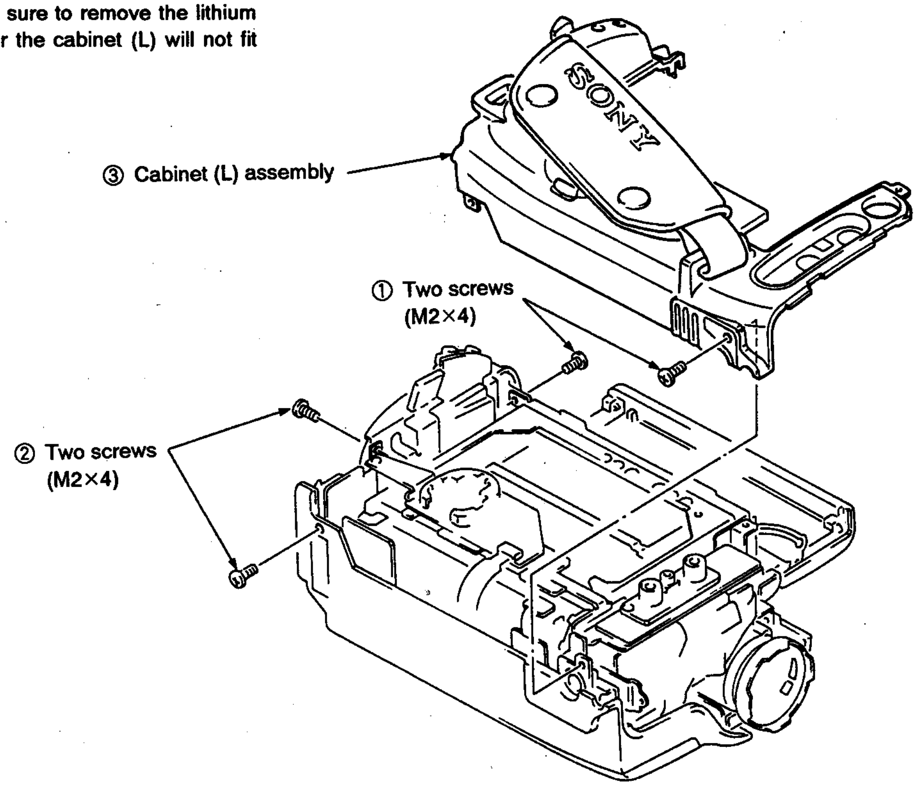

⑤ Flat cable
CN402 8P
(AU-183 board)
① Screw (M2×4)
② Screw (M2×4)
④ F panel block
③ Screw (M2×4)

2-2. REMOVAL OF CASSETTE LID ASSEMBLY


② Two screws
(M2×4)
③ Cassette lid assembly
① Open the lid.
(Control switch block (FK))

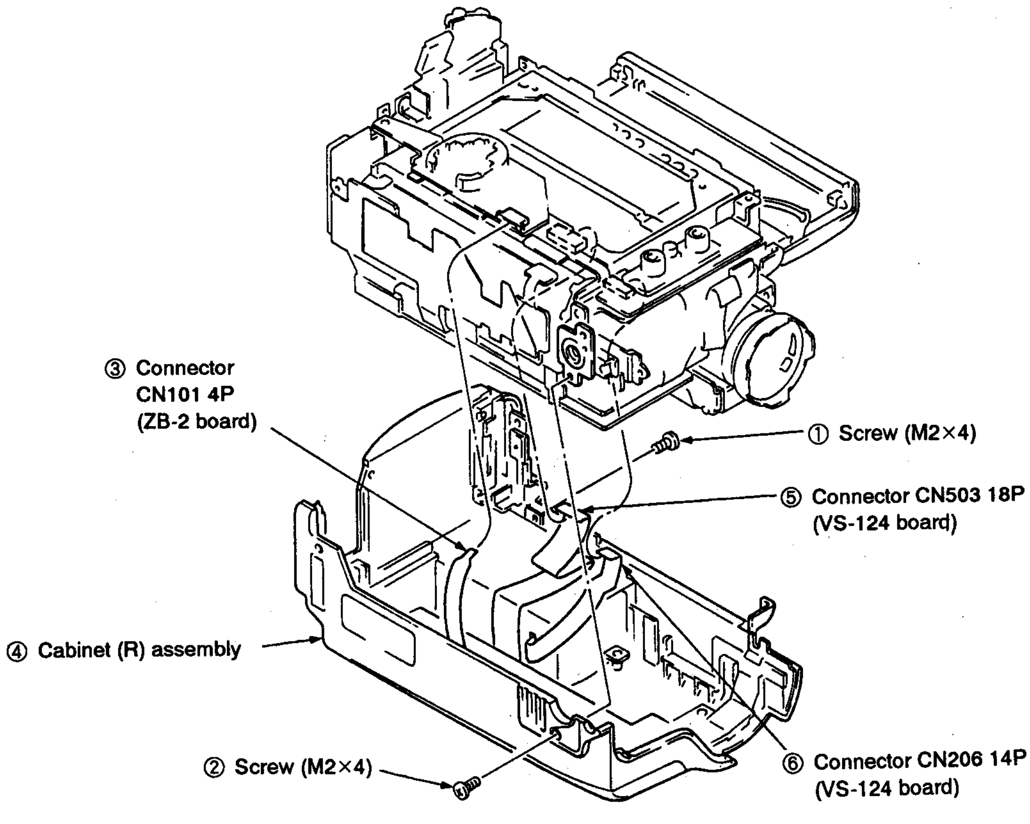
2-3. REMOVAL OF CABINET (L) ASSEMBLY

Note: When incorporating the cabinet (L) block assembly, be sure to remove the lithium battery first or the cabinet (L) will not fit properly.



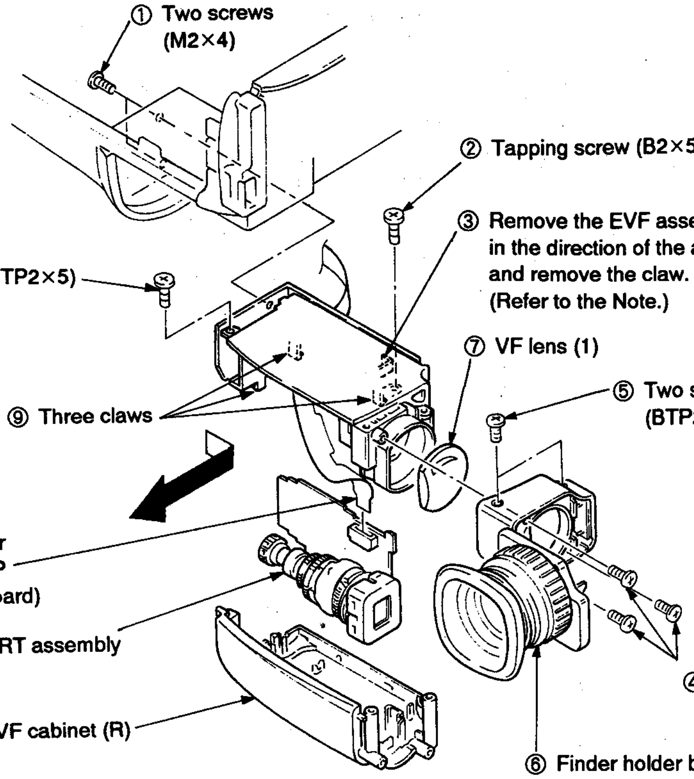
③ Cabinet (L) assembly
① Two screws (M2×4)
② Two screws (M2×4)
SONY

2-4. REMOVAL OF CABINET (R) ASSEMBLY



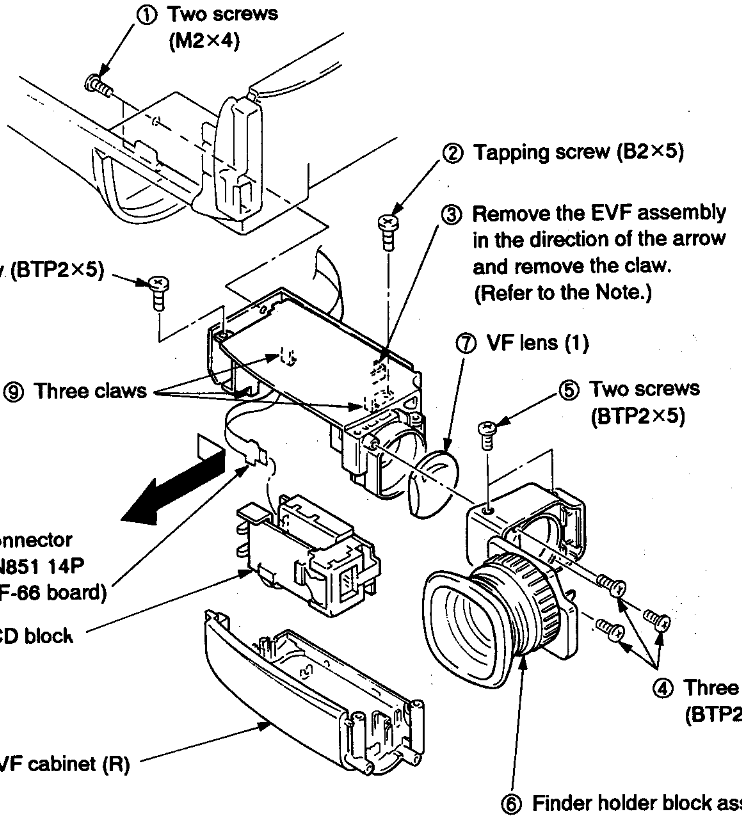
③ Connector CN101 4P (ZB-2 board)
① Screw (M2×4)
⑤ Connector CN503 18P (VS-124 board)
④ Cabinet (R) assembly
② Screw (M2×4)
⑥ Connector CN206 14P (VS-124 board)

2-5. REMOVAL OF EVF ASSEMBLY (TR23/TR380)



① Two screws (M2×4)
② Tapping screw (B2×5)
③ Remove the EVF assembly in the direction of the arrow and remove the claw. (Refer to the Note.)
⑧ Screw (BTP2×5)
⑦ VF lens (1)
⑤ Two screws (BTP2×5)
⑨ Three claws
⑫ Connector CN901 5P (VF-65 board)
⑪ CRT assembly
④ Three screws (BTP2×5)
⑩ EVF cabinet (R)
⑥ Finder holder block assembly

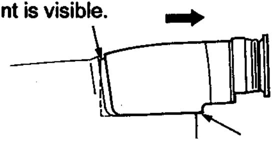
2-5. REMOVAL OF EVF ASSEMBLY (TR33/TR460)



① Two screws (M2×4)
② Tapping screw (B2×5)
③ Remove the EVF assembly in the direction of the arrow and remove the claw. (Refer to the Note.)
⑧ Screw (BTP2×5)
⑦ VF lens (1)
⑨ Three claws
⑤ Two screws (BTP2×5)
⑫ Connector CN851 14P (VF-66 board)
⑪ LCD block
④ Three screws (BTP2×5)
⑩ EVF cabinet (R)
⑥ Finder holder block assembly

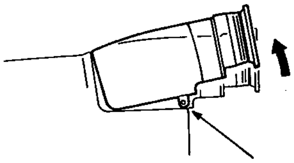
Note: Remove the EVF assembly not to harm the cabinet (R) as in the figure.

① Slide the EVF assembly.



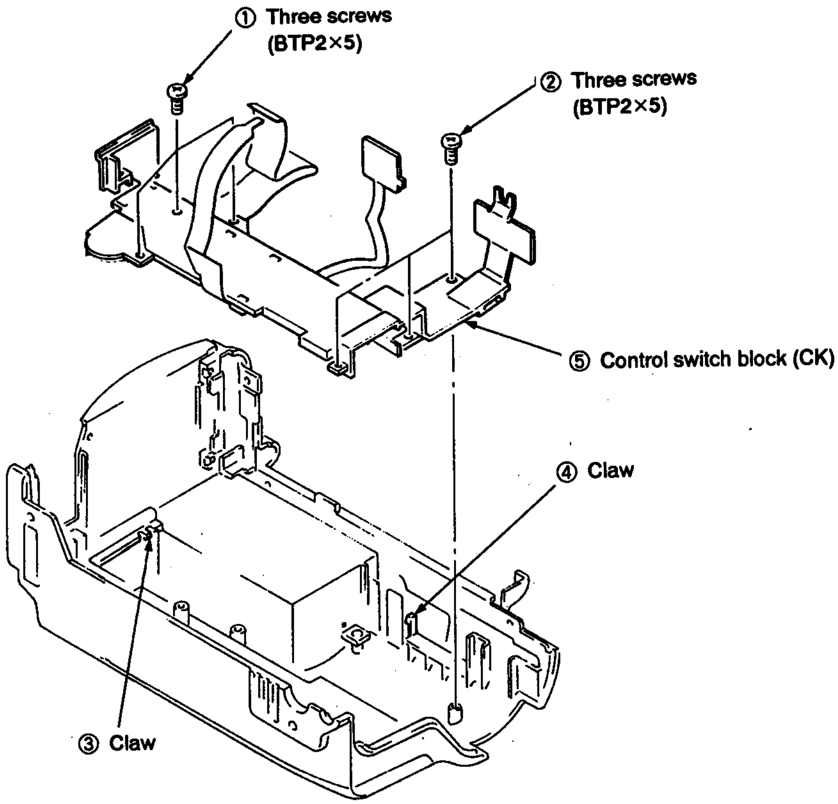
The point is visible.
A difference in level is formed.

② Remove the EVF assembly in the arrow direction.

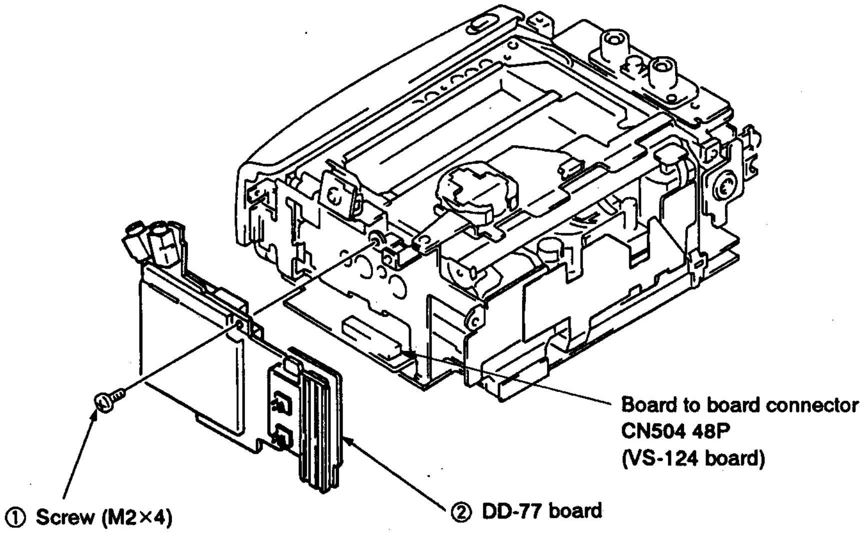


A projection of a screw clamp is come out.

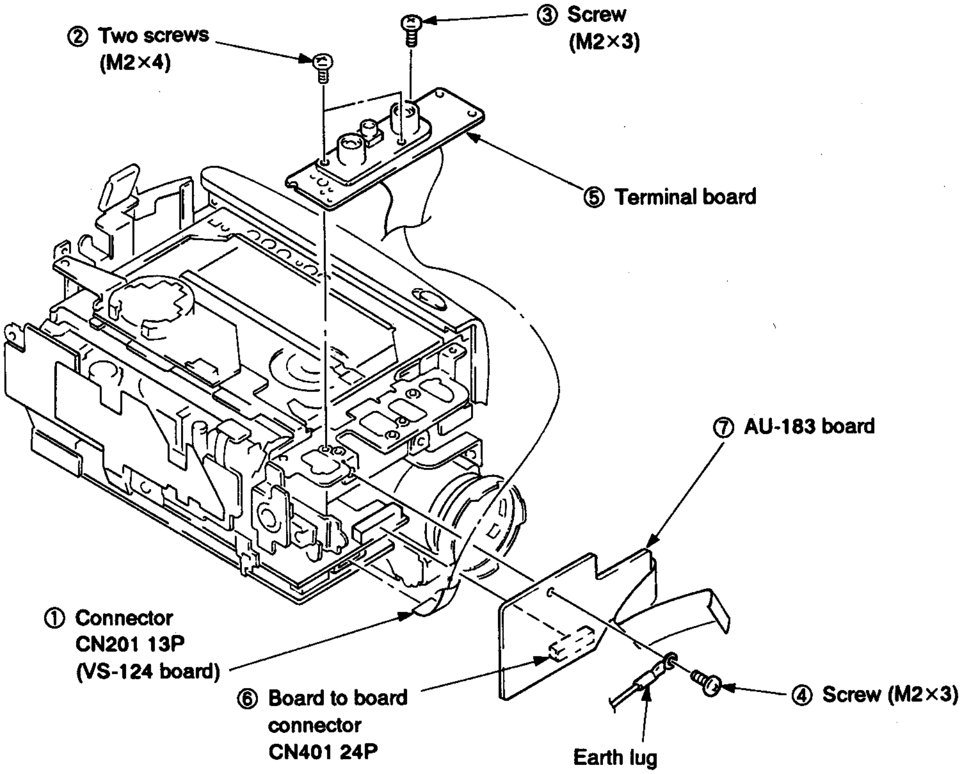
2-6. REMOVAL OF CONTROL SWITCH BLOCK (CK)


① Three screws
(BTP2×5)
② Three screws
(BTP2×5)
⑤ Control switch block (CK)
④ Claw
③ Claw

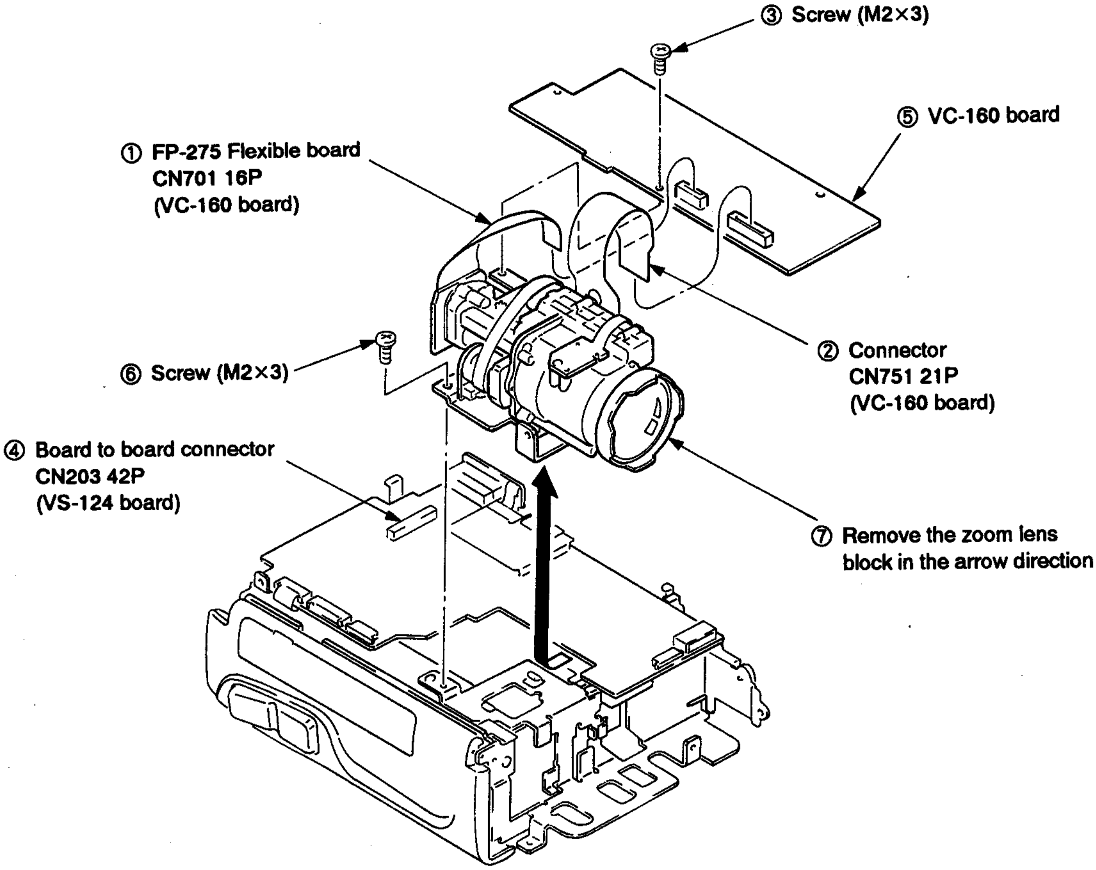
2-7. REMOVAL OF DD-77 BOARD


Board to board connector
CN504 48P
(VS-124 board)
① Screw (M2×4)
② DD-77 board

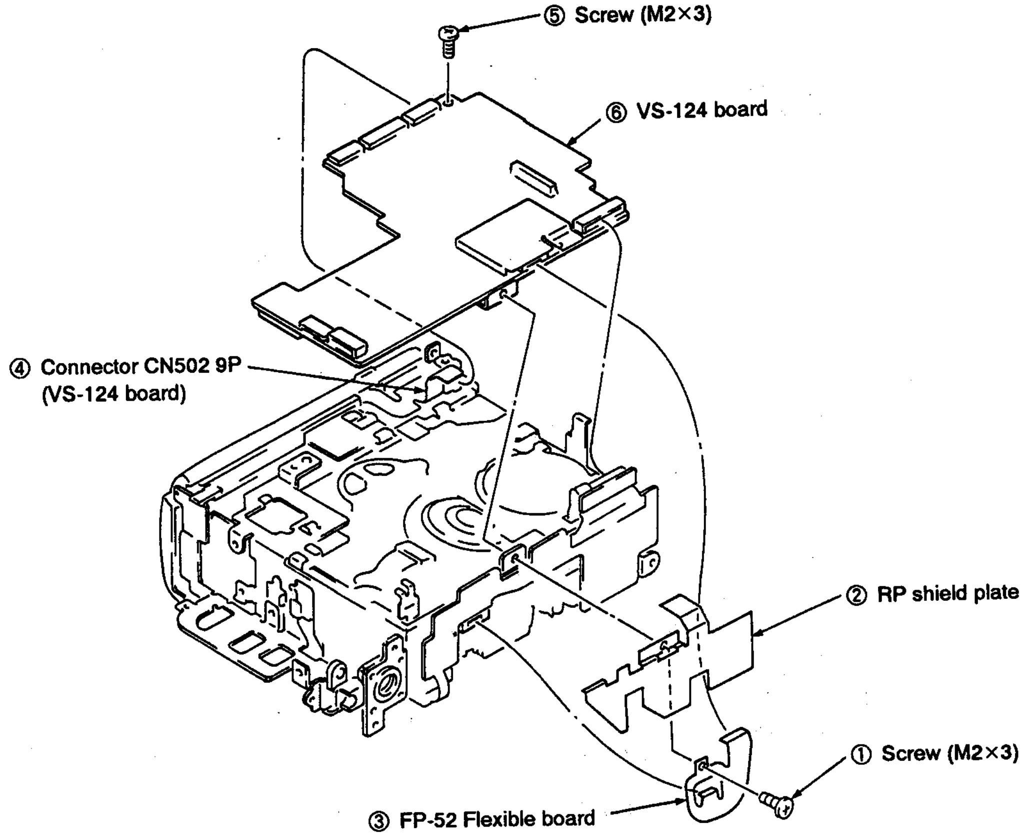
2-8. REMOVAL OF TERMINAL BOARD AND AU-183 BOARD


② Two screws
(M2×4)
③ Screw
(M2×3)
⑤ Terminal board
⑦ AU-183 board
① Connector
CN201 13P
(VS-124 board)
⑥ Board to board
connector
CN401 24P
Earth lug
④ Screw (M2×3)

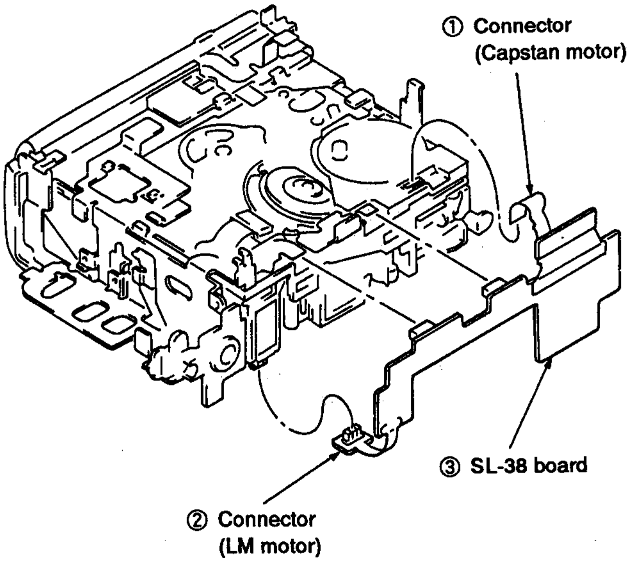
2-9. REMOVAL OF ZOOM LENS BLOCK AND VC-160 BOARD


③ Screw (M2×3)
⑤ VC-160 board
① FP-275 Flexible board
CN701 16P
(VC-160 board)
② Connector
CN751 21P
(VC-160 board)
⑥ Screw (M2×3)
④ Board to board connector
CN203 42P
(VS-124 board)
⑦ Remove the zoom lens
block in the arrow direction

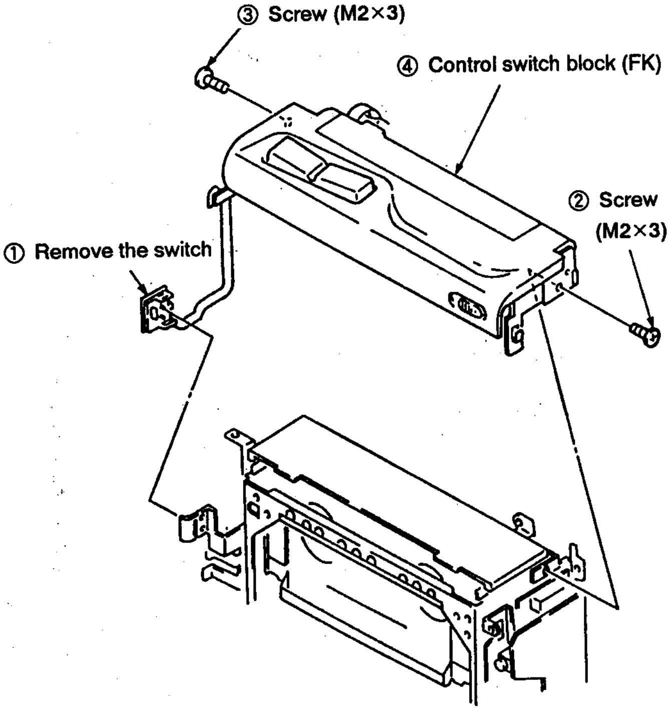
2-10. REMOVAL OF VS-124 BOARD


⑤ Screw (M2×3)
⑥ VS-124 board
④ Connector CN502 9P (VS-124 board)
② RP shield plate
① Screw (M2×3)
③ FP-52 Flexible board

2-11. REMOVAL OF SL-38 BOARD

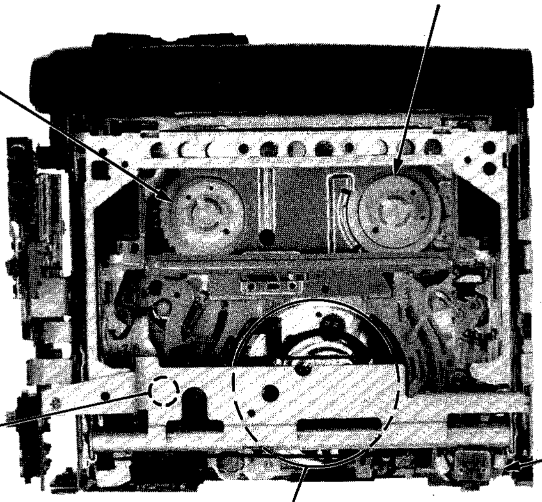

① Connector (Capstan motor)
③ SL-38 board
② Connector (LM motor)

2-12. REMOVE OF CONTROL SWITCH BLOCK (FK)


③ Screw (M2×3)
④ Control switch block (FK)
② Screw (M2×3)
① Remove the switch

2-13. INTERNAL VIEWS

— Left side —



S reel table assembly
X-3944-116-1

T reel table assembly
X-3941-274-1

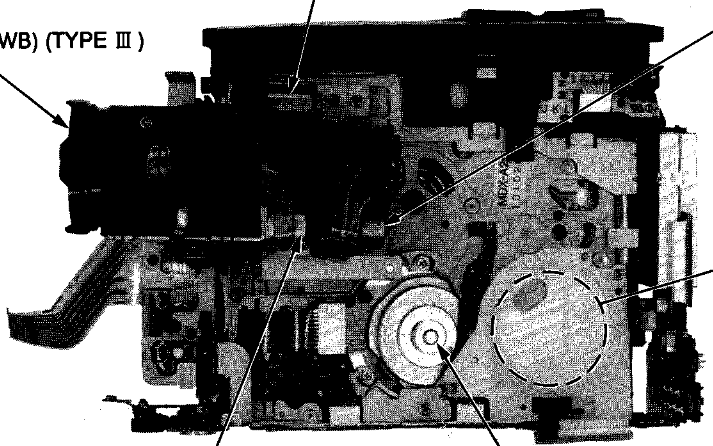
M902
Capstan motor
(SCE-0101A)
8-835-477-12

M903
Loading motor assembly
A-7040-304-A

M901

Drum assembly	DGH-78A-R	A-7048-564-A
Upper drum assembly	DGR-78-R	A-7049-501-A

— Right side —



M907 (TYPE Ⅱ)
IG meter (IRIS)
3-708-888-01
M910 (TYPE Ⅲ)
IRIS assembly
3-708-898-01

Device lens (LSV-140A) (TYPE Ⅰ)
8-848-704-01
Zoom lens (VCL-5412WA) (TYPE Ⅱ)
1-547-716-11
Zoom lens (VCL-5412WB) (TYPE Ⅲ)
1-547-739-11

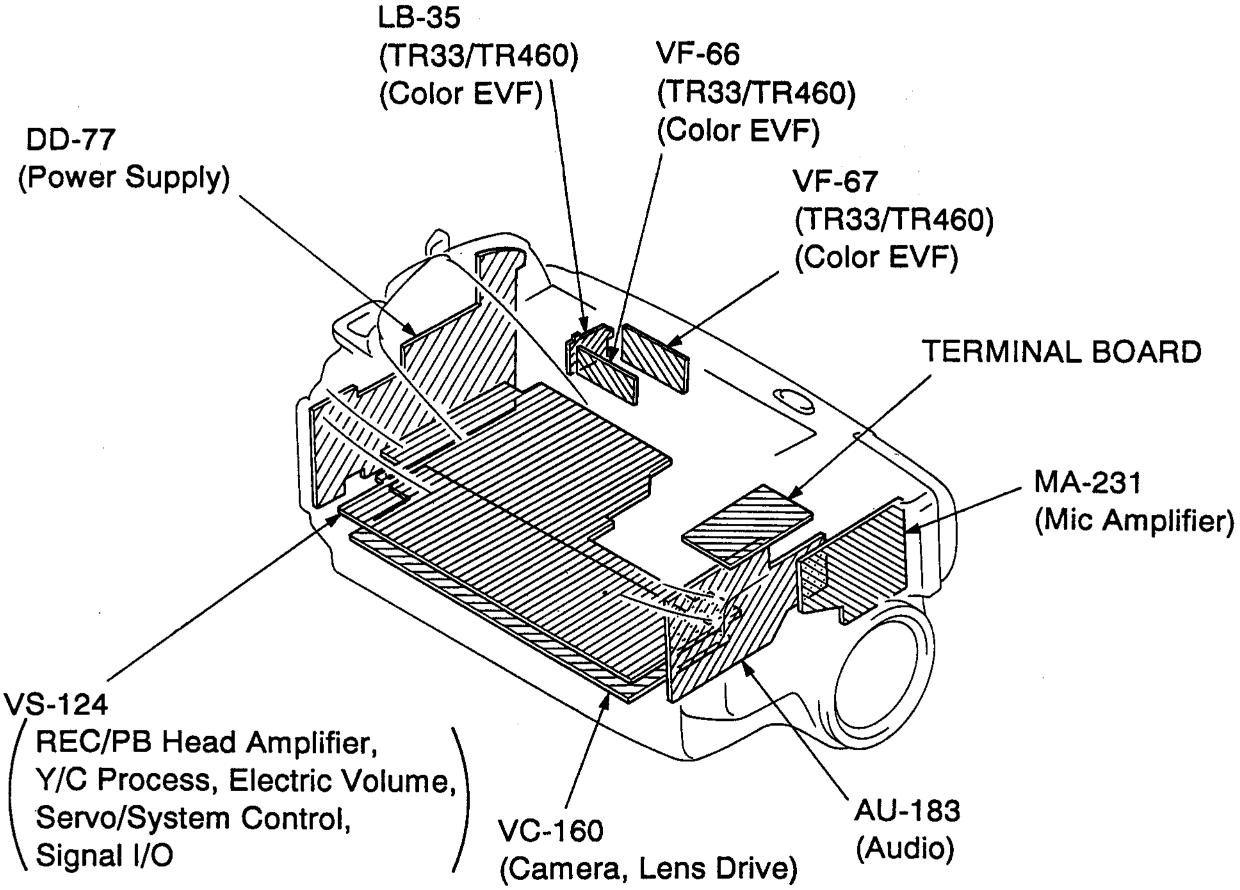
M905 (TYPE Ⅰ)
Focus motor assembly
1-698-364-01
M908 (TYPE Ⅱ)
Focus motor assembly
3-708-889-01
M911 (TYPE Ⅲ)
Focus motor assembly
3-708-897-01

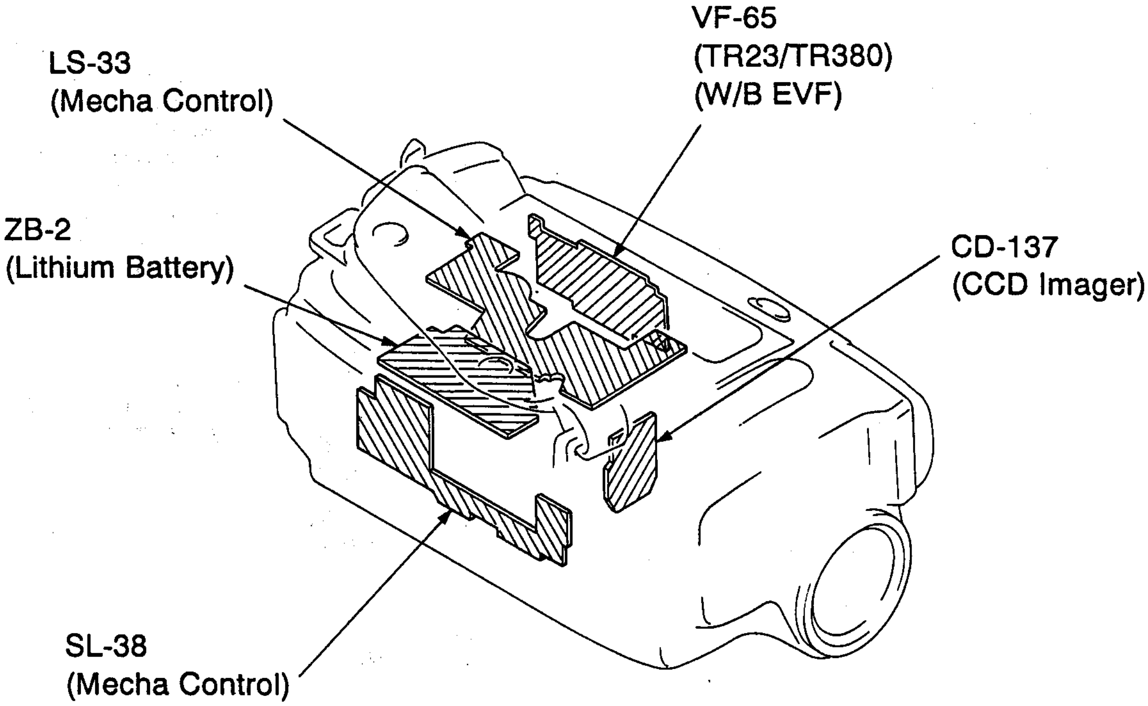
M902
Capstan motor (SCE-0101A)
8-835-477-12

M906 (TYPE Ⅰ)
Zoom motor assembly
1-698-363-01
M909 (TYPE Ⅱ)
Zoom motor assembly
3-708-887-01
M912 (TYPE Ⅲ)
Zoom motor assembly
3-708-896-01

M901
Drum assembly

2-14. CIRCUIT BOARDS LOCATION


LB-35
(TR33/TR460)
(Color EVF)
VF-66
(TR33/TR460)
(Color EVF)
DD-77
(Power Supply)
VF-67
(TR33/TR460)
(Color EVF)
TERMINAL BOARD
MA-231
(Mic Amplifier)
VS-124
(REC/PB Head Amplifier, Y/C Process, Electric Volume, Servo/System Control, Signal I/O)
VC-160
(Camera, Lens Drive)
AU-183
(Audio)


VF-65
(TR23/TR380)
(W/B EVF)
LS-33
(Mecha Control)
ZB-2
(Lithium Battery)
CD-137
(CCD Imager)
SL-38
(Mecha Control)

Sony Corporation
Consumer A&V Products Company
Personal A&V Products Div.

9-973-701-11

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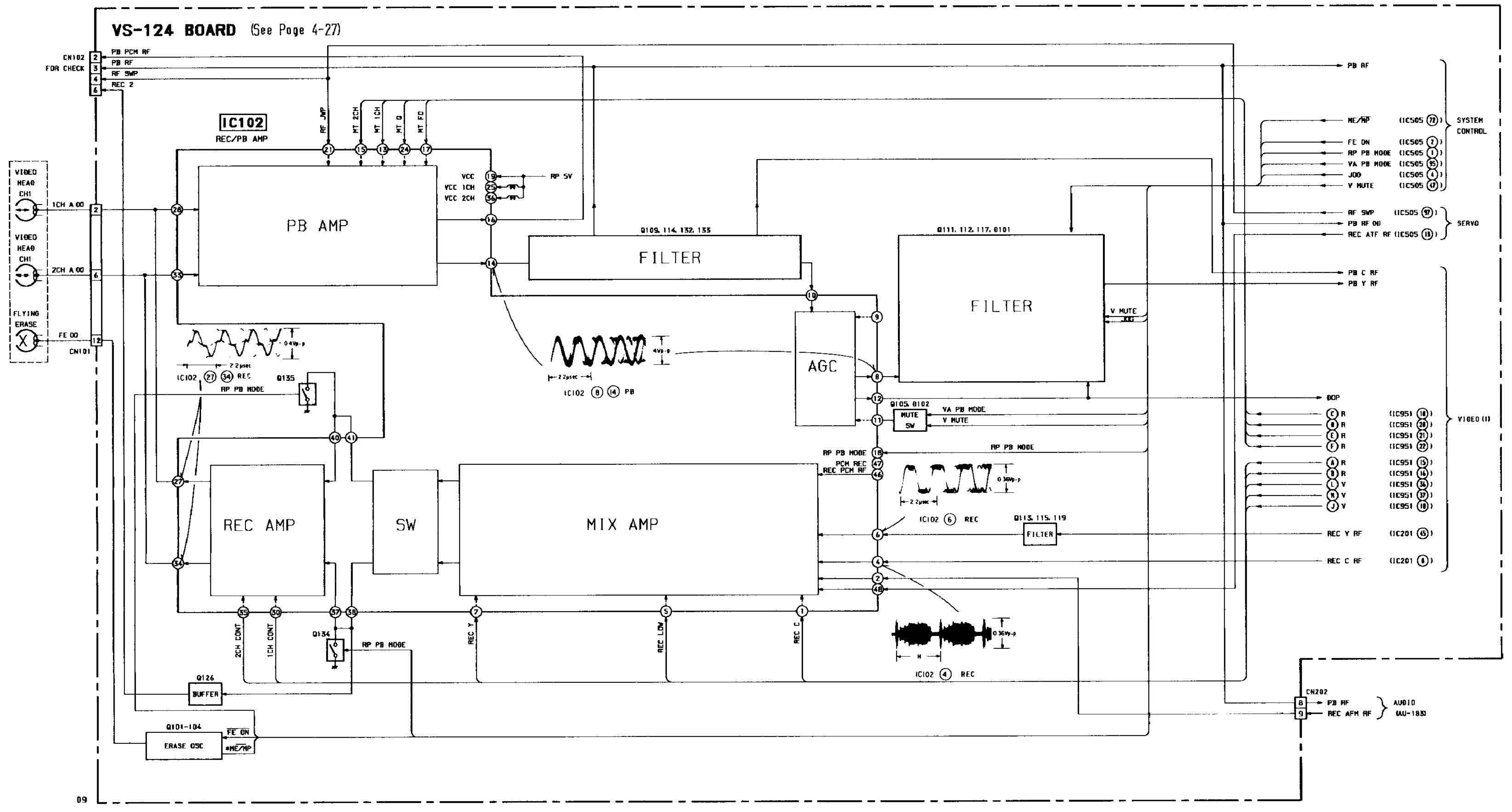
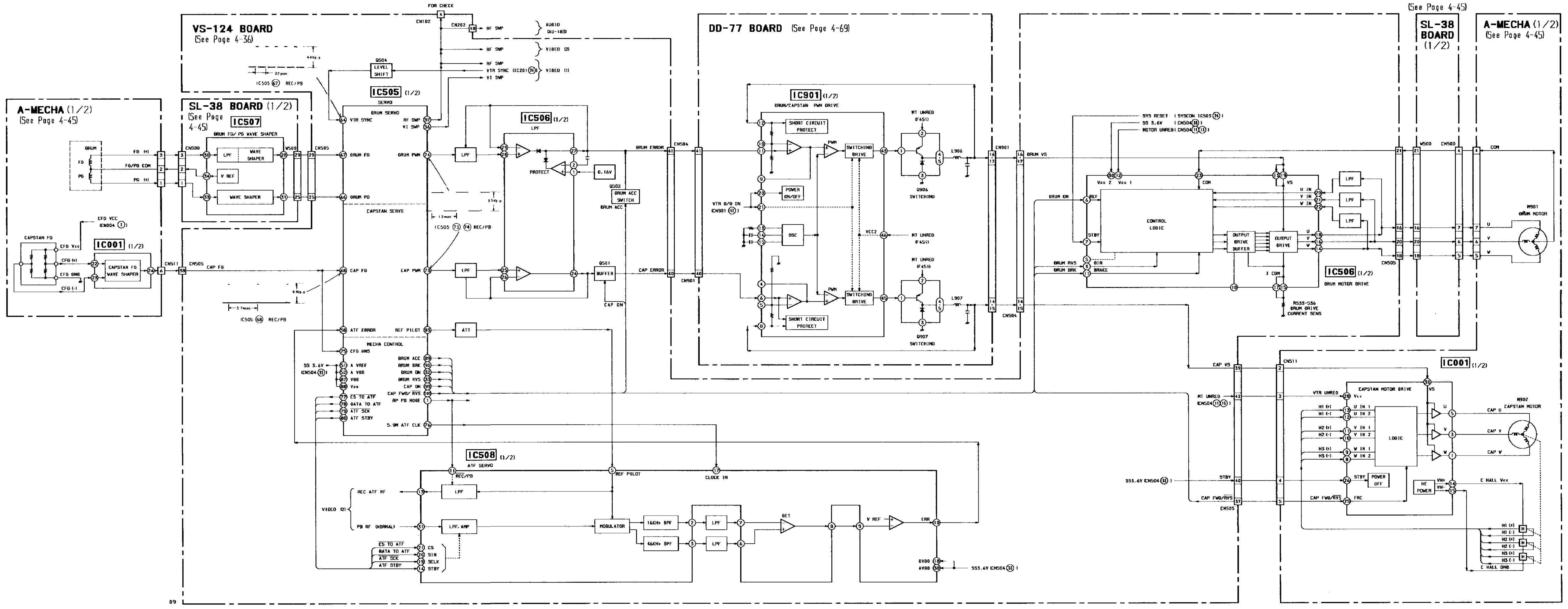
Quality Engineering Dept.

3-4. VIDEO (2) BLOCK DIAGRAM


VS-124 BOARD (See Page 4-27)
CN102 FOR CHECK
PB PCM RF
PB RF
RF SWP
REC 2
IC102
REC/PB AMP
RF SWP
MT 2CH
MT 1CH
MT Q
MT FO
VCC
VCC 1CH
VCC 2CH
RP 5V
PB AMP
VIDEO HEAD CH1
VIDEO HEAD CH1
FLYING ERASE
1CH A 00
2CH A 00
FE 00
CN101
Q109, 114, 132, 133
FILTER
Q111, 112, 117, 0101
FILTER
V MUTE
AGC
4Vp-p
2.2μsec
IC102 ⑧ ⑭ PB
0.4Vp-p
IC102 ㉗ ㉞ REC
Q135
RP PB MODE
Q105, Q102
MUTE SW
VA PB MODE
V MUTE
REC AMP
SW
MIX AMP
RP PB MODE
PCM REC
REC PCM RF
0.36Vp-p
IC102 ⑥ REC
Q113, 115, 119
FILTER
2CH CONT
1CH CONT
Q134
REC Y
REC LOW
REC C
H
IC102 ④ REC
Q126
BUFFER
Q101-104
ERASE OSC
FE ON
ME/MP
PB RF
ME/MP (IC505 ㉒)
FE ON (IC505 ②)
RP PB MODE (IC505 ①)
VA PB MODE (IC505 ㉟)
J00 (IC505 ④)
V MUTE (IC505 ㊼)
SYSTEM CONTROL
RF SWP (IC505 ㊷)
PB RF ON
REC ATF RF (IC505 ⑱)
SERVO
PB C RF
PB Y RF
DOP
VIDEO (1)
REC Y RF (IC201 ㊺)
REC C RF (IC201 ⑥)
CN202
PB RF
REC AFM RF
AUDIO (AU-183)
09

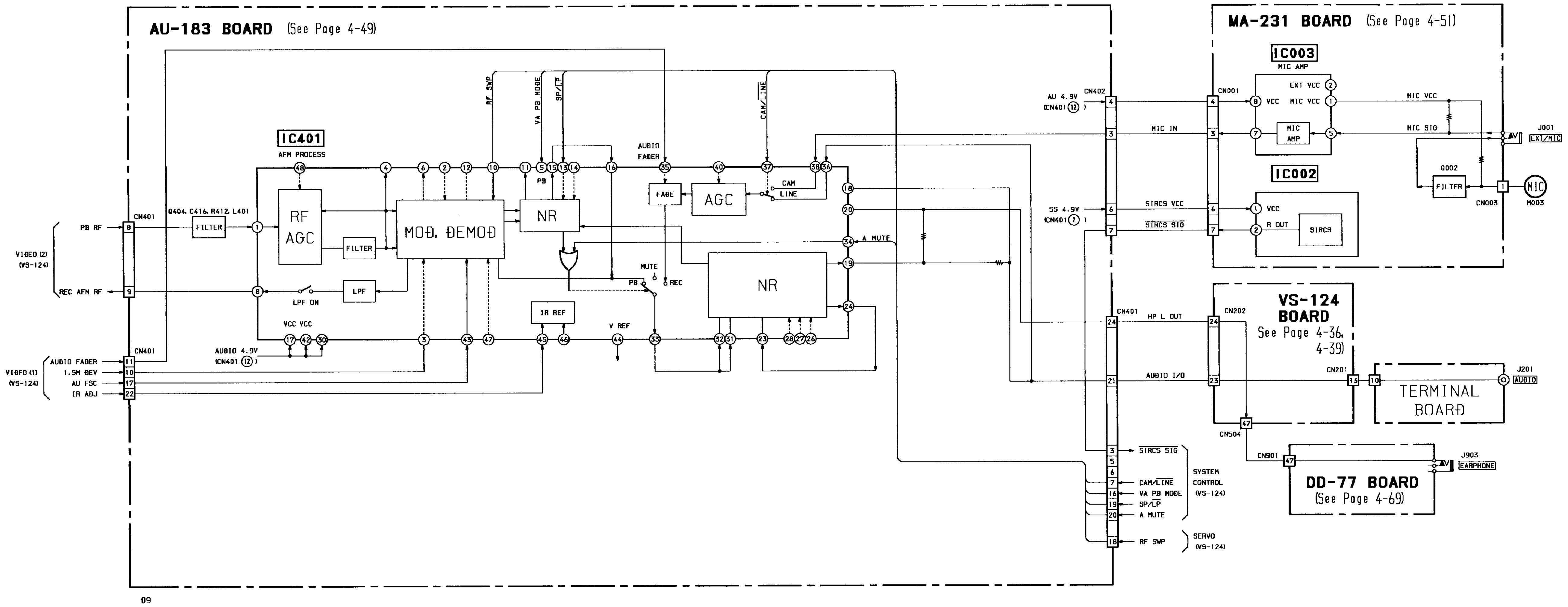
3-5. SERVO BLOCK DIAGRAM


A-MECHA (1/2) (See Page 4-45)
DRUM
FG
PG
CAPSTAN FG
IC001 (1/2)
CAPSTAN FG WAVE SHAPER
CFG VCC (CN004 ①)
SL-38 BOARD (1/2) (See Page 4-45)
IC507
DRUM FG/PG WAVE SHAPER
LPF
WAVE SHAPER
V REF
VS-124 BOARD (See Page 4-36)
FOR CHECK
CN102
CN202
RF SWP
AUDIO (AU-183)
VIDEO (2)
VTR SYNC (IC201 ㉛)
VIDEO (1)
V1 SWP
Q504 LEVEL SHIFT
IC505 ㊼ REC/PB
IC505 (1/2)
SERVO
DRUM SERVO
VTR SYNC
DRUM FG
DRUM PG
CAPSTAN SERVO
CAP FG
CAP PWM
DRUM PWM
ATF ERROR
REF PILOT
MECHA CONTROL
CFG HMS
A VREF
A VDD
VDD
Vss
CS TO ATF
DATA TO ATF
ATF SCK
ATF STBY
DRUM ACC
DRUM BRK
DRUM ON
DRUM RVS
CAP ON
CAP FWD/RVS
RP PB MODE
5.9M ATF CLK
SS 3.6V (CN504 ㉝)
IC505 ㉓ ㉔ REC/PB
IC505 ㊸ REC/PB
IC506 (1/2)
LPF
PROTECT
0.16V
Q502 DRUM ACC SWITCH
Q501 BUFFER
ATT
DRUM ERROR
CAP ERROR
CAP ON
IC508 (1/2)
ATF SERVO
REC/PB
REF PILOT
CLOCK IN
REC ATF RF
PB RF (NORMAL)
LPF. AMP
MODULATOR
16kHz BPF
46kHz BPF
DET
V REF
ERR
CS
SIN
SCLK
STBY
DVDD
AVDD
SS3.6V (CN504 ㉝)
DD-77 BOARD (See Page 4-69)
IC901 (1/2)
DRUM/CAPSTAN PWM DRIVE
SHORT CIRCUIT PROTECT
PWM
SWITCHING DRIVE
POWER ON/OFF
OSC
VCC2
VTR D/D ON (CN901 ④)
MT UNREG (F451)
Q906 SWITCHING
Q907 SWITCHING
L906
L907
CN901
CN504
SYS RESET (SYSCON IC503 ㉖)
SS 3.6V (CN504 ㉝)
MOTOR UNREG (CN504 ⑪ ⑬)
DRUM VS
DRUM ON
DRUM RVS
DRUM BRK
DIR
BRAKE
CONTROL LOGIC
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
COM
U IN
V IN
W IN
IC506 (1/2)
DRUM MOTOR DRIVE
R533-536 DRUM DRIVE CURRENT SENS
SL-38 BOARD (1/2) (See Page 4-45)
A-MECHA (1/2) (See Page 4-45)
M901 DRUM MOTOR
CN511
CAP VS
MT UNREG (CN504 ⑪ ⑬)
SS3.6V (CN504 ㉝)
STBY
CAP FWD/RVS
CN505
IC001 (1/2)
CAPSTAN MOTOR DRIVE
VTR UNREG
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
LOGIC
POWER OFF
HE POWER
FRC
C HALL Vcc
C HALL GND
M902 CAPSTAN MOTOR
CAP U
CAP V
CAP W
09

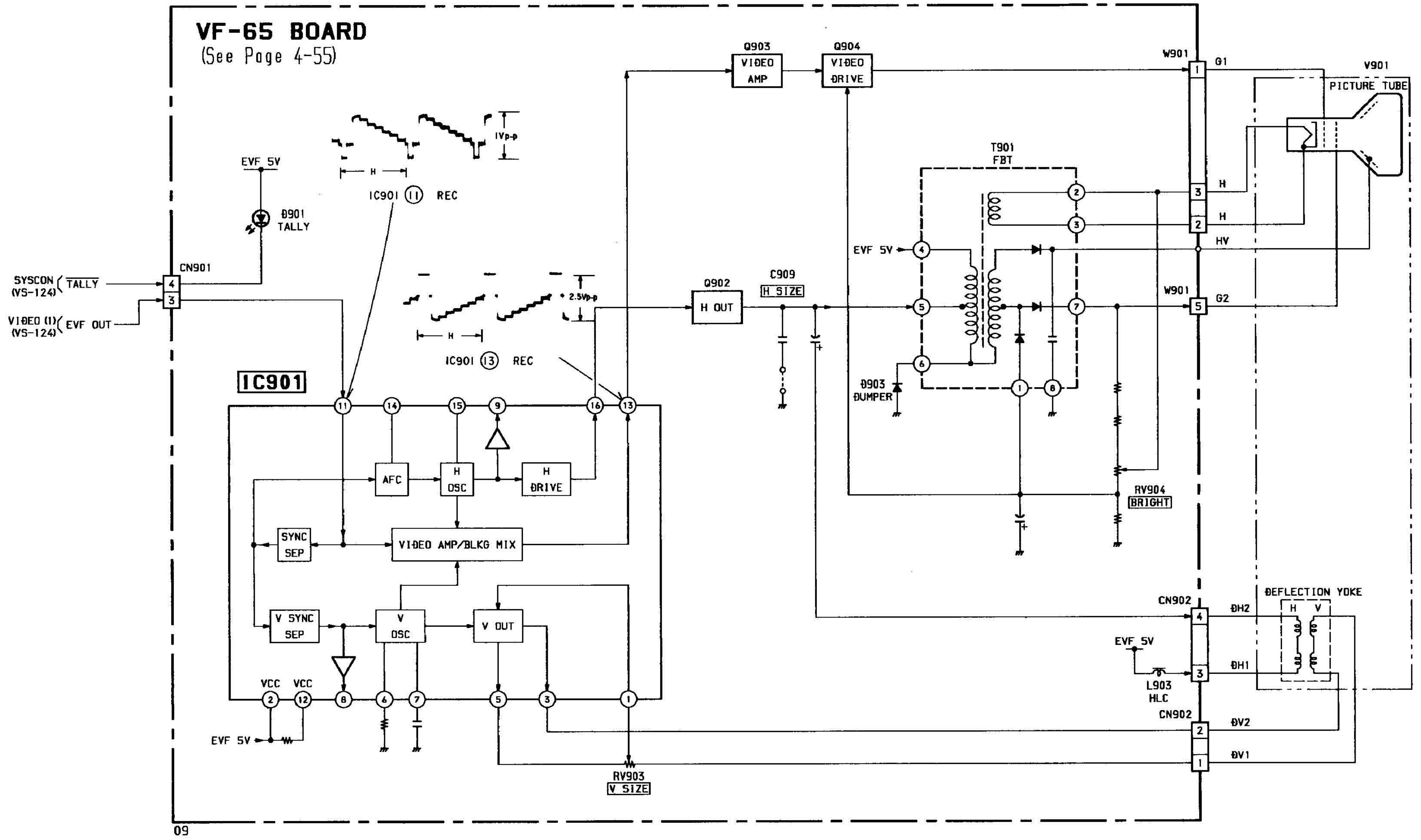
3-6. SYSTEM CONTROL BLOCK DIAGRAM

VS-124 BOARD
(See Page 4-36)
IC503
MODE CONTROL (MASTER)
IC501
EEP ROM
IC502
IC505
SERVO/SYSTEM CONTROL
IC508
CONTROL SWITCH BLOCK (FK)
CONTROL SWITCH BLOCK (CK)
ZB-2 BOARD
(See Page 4-42)
MA-231 BOARD
(See Page 4-51)
IC002
AU-183 BOARD
(See Page 4-49)
DD-77 BOARD
(See Page 4-69)
IC507
SL-38 BOARD (1/2)
(See Page 4-45)
SL-38 BOARD (1/2)
(See Page 4-45)
IC507
LOADING MOTOR DRIVE
A-MECHA CHASSIS
(See Page 4-45)
LM-40 BOARD
LS-33 BOARD
(See Page 4-45)
EVF
CAMERA
VIDEO (1)
VIDEO (2)
CCD-TR33/TR460

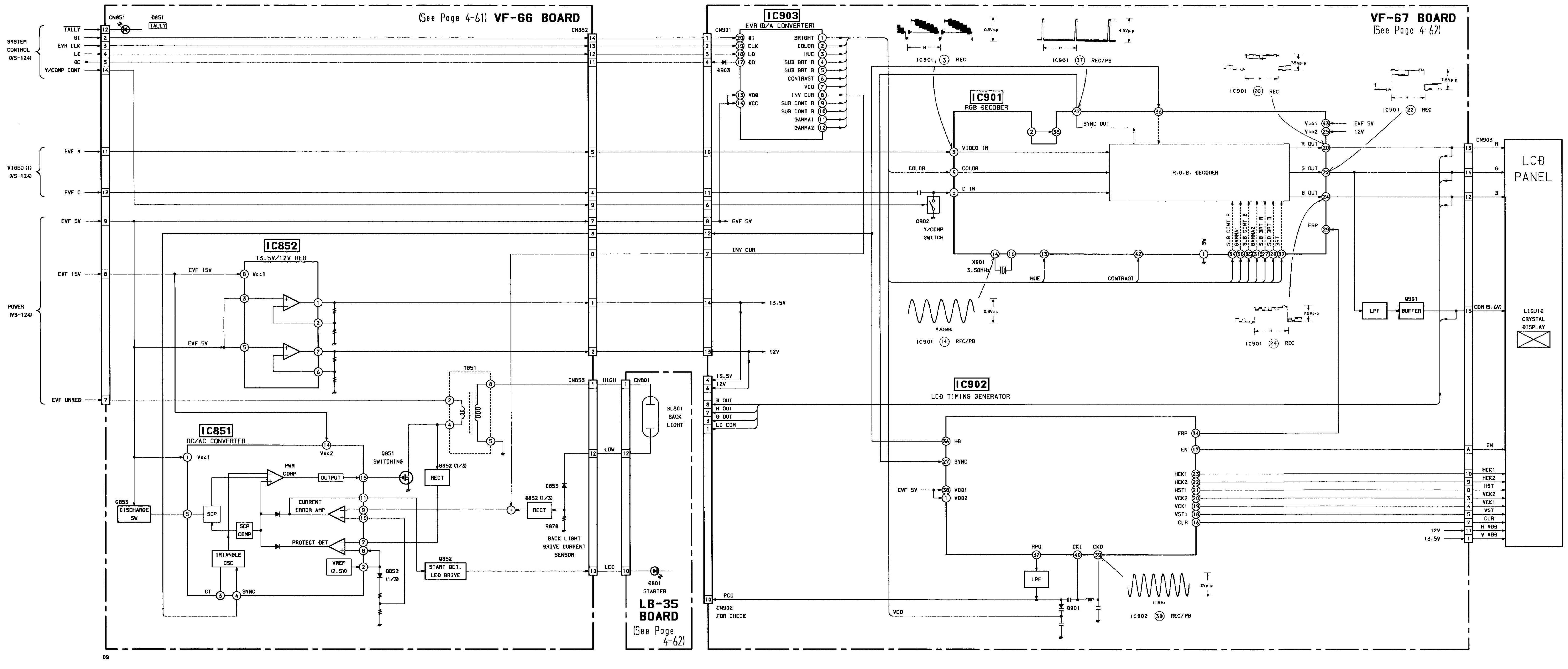
3-7. AUDIO BLOCK DIAGRAM


AU-183 BOARD (See Page 4-49)
IC401
AFM PROCESS
RF AGC
FILTER
MOD, DEMOD
NR
LPF
LPF ON
IR REF
V REF
VCC VCC
AUDIO FADER
FADE
AGC
CAM
LINE
MUTE
PB
REC
A MUTE
RF SWP
VA PB MODE
SP/LP
CAM/LINE
Q404, C416, R412, L401
CN401
PB RF
REC AFM RF
VIDEO (2) (VS-124)
AUDIO FADER
1.5M DEV
AU FSC
IR ADJ
VIDEO (1) (VS-124)
AUDIO 4.9V (CN401 ⑫)
AU 4.9V (CN401 ⑫)
CN402
MIC IN
SS 4.9V (CN401 ②)
SIRCS VCC
SIRCS SIG
HP L OUT
AUDIO I/O
SIRCS SIG
CAM/LINE
VA PB MODE
SP/LP
A MUTE
SYSTEM CONTROL (VS-124)
RF SWP
SERVO (VS-124)
MA-231 BOARD (See Page 4-51)
IC003
MIC AMP
CN001
VCC
EXT VCC
MIC VCC
MIC AMP
MIC VCC
MIC SIG
J001
EXT/MIC
Q002
FILTER
CN003
MIC
M003
IC002
VCC
R OUT
SIRCS
VS-124 BOARD
See Page 4-36, 4-39)
CN202
CN201
CN504
TERMINAL BOARD
J201
AUDIO
CN901
DD-77 BOARD
(See Page 4-69)
J903
EARPHONE
09

3-8. B/W EVF BLOCK DIAGRAM


VF-65 BOARD
(See Page 4-55)
EVF 5V
D901 TALLY
CN901
SYSCON (VS-124)
TALLY
VIDEO (1) (VS-124)
EVF OUT
1Vp-p
H
IC901 ⑪ REC
2.5Vp-p
IC901 ⑬ REC
IC901
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC VCC
EVF 5V
RV903
V SIZE
Q903
VIDEO AMP
Q904
VIDEO DRIVE
Q902
H OUT
C909
H SIZE
T901
FBT
EVF 5V
D903
DUMPER
RV904
BRIGHT
W901
G1
H
H
HV
G2
V901
PICTURE TUBE
DEFLECTION YOKE
H V
CN902
DH2
DH1
DV2
DV1
EVF 5V
L903
HLC
09

3-9. COLOR EVF BLOCK DIAGRAM


SYSTEM CONTROL (VS-124)
TALLY
DI
EVR CLK
LD
DO
Y/COMP CONT
VIDEO (1) (VS-124)
EVF Y
FVF C
POWER (VS-124)
EVF 5V
EVF 15V
EVF UNREG
(See Page 4-61) VF-66 BOARD
CN851
D851 TALLY
CN852
IC852
13.5V/12V REG
Vcc1
IC851
DC/AC CONVERTER
Vcc2
PWM COMP
OUTPUT
CURRENT ERROR AMP
PROTECT DET
SCP
SCP COMP
TRIANGLE OSC
VREF (2.5V)
CT
SYNC
Q853 DISCHARGE SW
Q851 SWITCHING
T851
D852 (1/3)
RECT
D853
R878
BACK LIGHT DRIVE CURRENT SENSOR
Q852 START DET. LED DRIVE
CN853
HIGH
LOW
LED
09
CN801
BL801 BACK LIGHT
D801 STARTER
LB-35 BOARD (See Page 4-62)
VF-67 BOARD (See Page 4-62)
CN901
IC903
EVR (D/A CONVERTER)
DI
CLK
LD
DO
D903
VDD
VCC
BRIGHT
COLOR
HUE
SUB BRT R
SUB BRT B
CONTRAST
VCO
INV CUR
SUB CONT R
SUB CONT B
GAMMA1
GAMMA2
IC901
RGB DECODER
VIDEO IN
COLOR
C IN
SYNC OUT
R.G.B. DECODER
R OUT
G OUT
B OUT
FRP
Vcc1
Vcc2
EVF 5V
12V
SW
SUB CONT R
GAMMA1
SUB CONT B
GAMMA2
SUB BRT R
SUB BRT B
BRT
HUE
CONTRAST
X901 3.58MHz
Q902 Y/COMP SWITCH
INV CUR
13.5V
12V
0.5Vp-p
H
IC901 ③ REC
4.5Vp-p
IC901 (37) REC/PB
7.5Vp-p
IC901 ⑳ REC
IC901 ㉒ REC
0.8Vp-p
4.43MHz
IC901 ⑭ REC/PB
IC901 ㉔ REC
LPF
Q901 BUFFER
CN903
R
G
B
COM (5.6V)
LCD PANEL
LIQUID CRYSTAL DISPLAY
IC902
LCD TIMING GENERATOR
HD
SYNC
VDD1
VDD2
FRP
EN
HCK1
HCK2
HST1
VCK2
VCK1
VST1
CLR
RPD
CKI
CKO
D901
VCO
PCO
CN902 FOR CHECK
B OUT
R OUT
G OUT
LC COM
HST
VST
H VDD
V VDD
2Vp-p
11MHz
IC902 (39) REC/PB

3-10. POWER BLOCK DIAGRAM

MA-231 BOARD
IC003
MIC AMP
IC002
REMOTE CONTROL RECIEVER
CN001
(See Page 4-51)
AU4.9V
SIRCS VCC
CN402
CN401
AUDIO REC/PB PROCESS
IC401
AU-183 BOARD
(See Page 4-49)
TERMINAL BOARD
J201
RFU DC OUT
DD-77 BOARD (See Page 4-69)
J901
BATTERY TERMINAL
F451
F450
F452
MT UNREG
CAM UNREG
VTR UNREG
L901
L902
L903
IC901
DC/DC CONVERTER
VCC1
TRIANGLE OSC
PWM MOD
SWITCHING DRIVE
VOLTAGE ERROR AMP
V REF
SHORT CIRCUIT DETECT
F ON
POWER ON
ABCDE ON
CCD-TR23/TR380
CCD-TR33/TR460
TIMER LATCH, SHORT CIRCUIT PROTECT
V REF
DRUM/CAPSTAN PWM DRIVE
Q902
SWITCHING
T901
D901 (1/2)
-8.5V RECT
15V RECT
L914
L915
CCD-TR33/TR460
Q900, Q901 (1/2)
CCD-TR23/TR380
Q915
EMERGENCY DETECT
Q914
EMERGENCY DETECT
Q908
Q910
Q909
L917
Q901 (1/2)
Q904
SWITCHINGE
L905
L912
L910
L909
Q903
SWITCHING
L904
L916
Q905
SWITCHING
L908
Q906, 907
DRUM VS / CAP VS SWITCHING
CAM DD ON
MOTOR UNREG
VTR UNREG
EVF UNREG
CAM-8.5V
CAM15V
EVF15V
CAM5V
D5V
EVF5V
VIDEO5V
AU5V
RP5V
D3.6V
SS3.6V
MT5V
MT5V (FOR MD3.6V)
VTR DD ON
CAM DD ON
LANC SIG
LANC DC
CN901
J902
REMOTE
D9
CN504
CN202
CN201
DC OUT
VS-124 BOARD
(See Page 4-27, 4-30, 4-34, 4-36, 4-39)
EVF 15V
EVF 5V
CN206
Q951, 952
CURRENT LIMITER
D/A CONVERTER (EVR)
IC951
VIDEO 4.9V
VIDEO (1) Y/CHROMA PROCESS
IC201, 203, IC205
VIDEO (2) REC/PB AMP
IC102
EEP ROM
IC501
ATF SERVO, CLOG DETECT PB SP/LP DETECT
IC508
SERVO, SYSTEM CONTROL
IC505
SS3.6V
VTR UNREG
IC503
MODE CONTROL
BATT SENS
BATT IN
CLK 10M/32K
VCC
V3
AVCC
RESET
LI PREEND
LANC POWER ON
VTR DD ON
CAM DD ON
IC502
PS501
3.6V REG
BATTERY IN DETECT
INITIAL RESET
LITHIUM BATTERY PRE END DETECT
WAKE UP
EVER 3.6V
UNREG
POWER CONT
LANC OUT
LANC DC
CN505
CN203
IC506
DRUM MOTOR DRIVE
PS500
MT5V (FOR MD 3.6V)
MT UNREG
W500
Q560-562
3.6V REG
L505
IC507
VC
LOADING MOTOR DRIVE
DRUM FG/PG AMP REEL FG AMP
CURRENT LIMITER
5.6V REG
MD SENSER 3.6V
CN502
SL-38 BOARD
(See Page 4-45)
CN511
CAPSTAN MOTOR DRIVE
IC001
REEL FG, TAPE LED
LS-33 BOARD
(See Page 4-45)
CN502
ZOOM SWITCH
CONTROL SWITCH BLOCK (FK)
CN503
LI 3V
D501
FUCTION KEY
CONTROL SWITCH BLOCK (CK)
CN101
LITHIUM BATTERY
ZB-2 BOARD
(See Page 4-42)
CCD-TR33/TR460
COLOR ELECTRIC VIEW FINDER
VF-66 BOARD
(See Page 4-61)
IC852
13.5V/12V REG
CN953
CN851
L853
IC851
T851
DC/AC CONV
HIGH
CN853
CN801
BL801
BACK LIGHT
LB-35 BOARD
(See Page 4-62)
CN902
FOR CHECK
13.5V
12V
EVF 5V
CN901
IC901, IC902
LCD DRIVE
IC903
D/A CONVERTER (EVR)
VF-67 BOARD
(See Page 4-62)
VVDD
HVDD
CN903
LCD PANEL
CCD-TR23/TR380
VF-65 BOARD
(See Page 4-55)
CN501
CRT DRIVE
IC901
VC-160 BOARD (See Page 4-9, 4-13, 4-18)
IC604
CHARACTER MIX
D/A CONVERTER (EVR)
IC603
A/D CONVERTER
IC704
TIMING GENERATOR
IC702
V DRIVE V SUB REG
IC701
IRIS DRIVE HALL AMP
IC751, IC752, IC755
FOCUS/ZOOM PRE DRIVE
IC753
FOCUS/ZOOM DRIVE
IC754
CN601
CAMERA CONTROL
IC602
EEP ROM
IC601
SYNC GENERATOR
IC610
OPTICAL DETECTER
IC611
CAMERA CORE (DIGITAL CAMERA PROCESS)
IC609
ON SCREEEN DISPLAY
IC614
S/H, AGC SIGNAL SEPARATION
IC703
DETECT COMPENSATOR
IC705
CN701
SENS VCC
CN751
CD-137 BOARD
(See Page 4-5)
W692
IC691
CCD IMAGER
FOCUS ZOOM SENSOR
ZOOM LENS UNIT

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing. (The other layers'patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- ○: Through hole .

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted. Chip resistor are 1/10W or 1/16W unless otherwise noted. kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repeair.*
- —— : B+ Line.*
- - - - : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

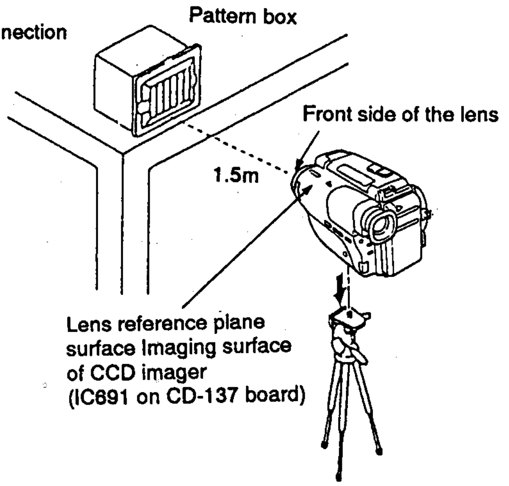
*: indicated by the color red.

- **Measuring conditions voltage value and waveform.**

(CAMERA REC mode)

- The object is color bar chart of pattern box.*
- Voltages are dc between ground and measurement points.* Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

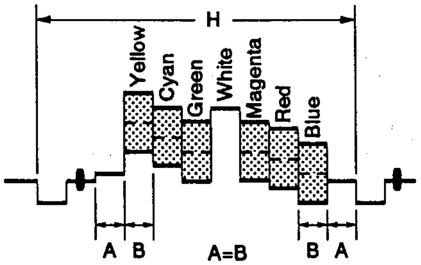


Fig. a (Video output terminal output waveform)

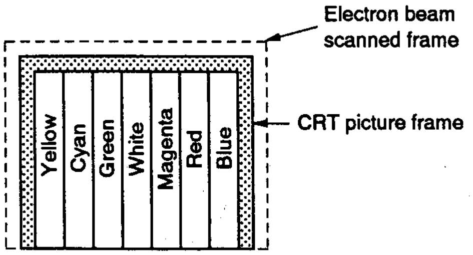


Fig. b (Picture on monitor TV)

(REC/PB mode)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

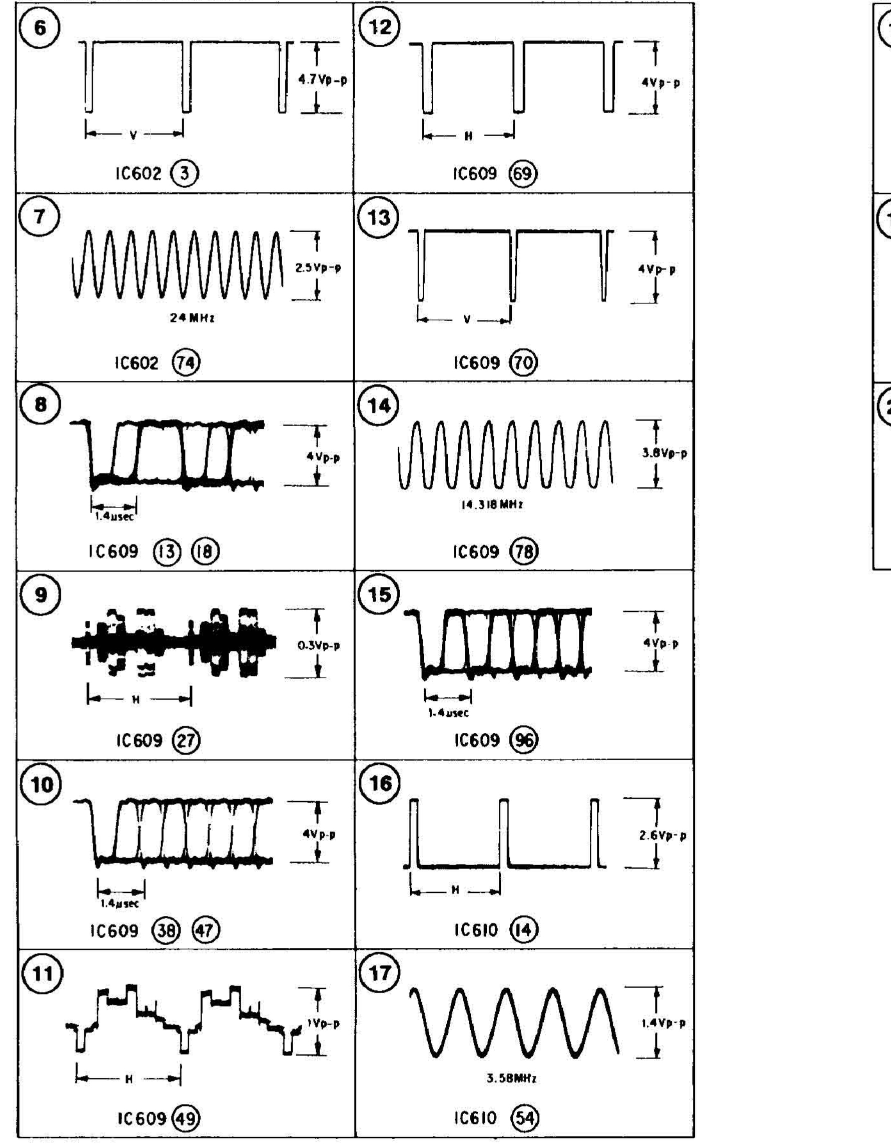
Note: Refer to "3-1-4. How to set the REC Mode" in VIDEO SECTION ADJUSTMENT. (See Page 6–36).

VC-160 (CAMERA) SCHEMATIC DIAGRAM
— Ref. No. VC-160 BOARD; 2,000 series —

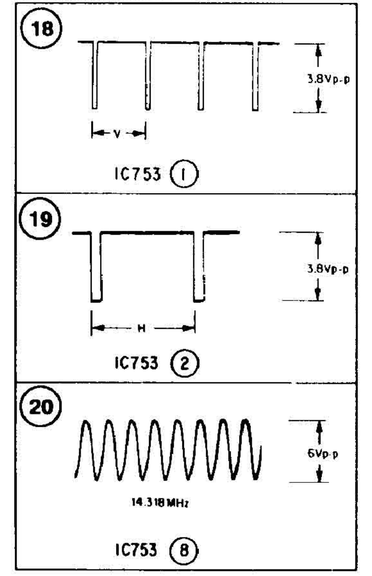
• Refer to page 4-7 for Printed Wiring Board.

VC-160 BOARD (2/3)
·SIGNAL PATH
VIDEO SIGNAL
CHROMA
Y
Y/CHROMA
REC
PB
TO VC-160 BOARD (1/3) (See Page 4-10)
TO VC-160 BOARD (3/3) (See Page 4-19)
HALL GAIN
HALL OFFSET
REF2V
HD
PBV
CL
CAM GND
CAM 5V
PBB RESET
CS PSR
CAM SI
CAM SO
CAM SCK
NTSC
MT 5V
MT GND
LENS TYP
HALL A/D
IRIS PWM
RST LED
FC RST
ZM RST
IC601 EEP ROM
IC602 CAMERA CONTROL
IC603 D/A CONVERTER
IC610 SYNC GENERATOR
IC611 OPTICAL DETECTOR
IC609 CAMERA CORE DIGITAL CAMERA PROCESS
IC604 CHARACTOR MIX
IC614 ON SCREEN DISPLAY
Q604, 607 CAM Y BUFFER
Q605, 606 CAM C BUFFER
TO VS-124 BOARD CN203 (See Page 4-39)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
A B C D E F G H I J

VC-160 BOARD (2/3)



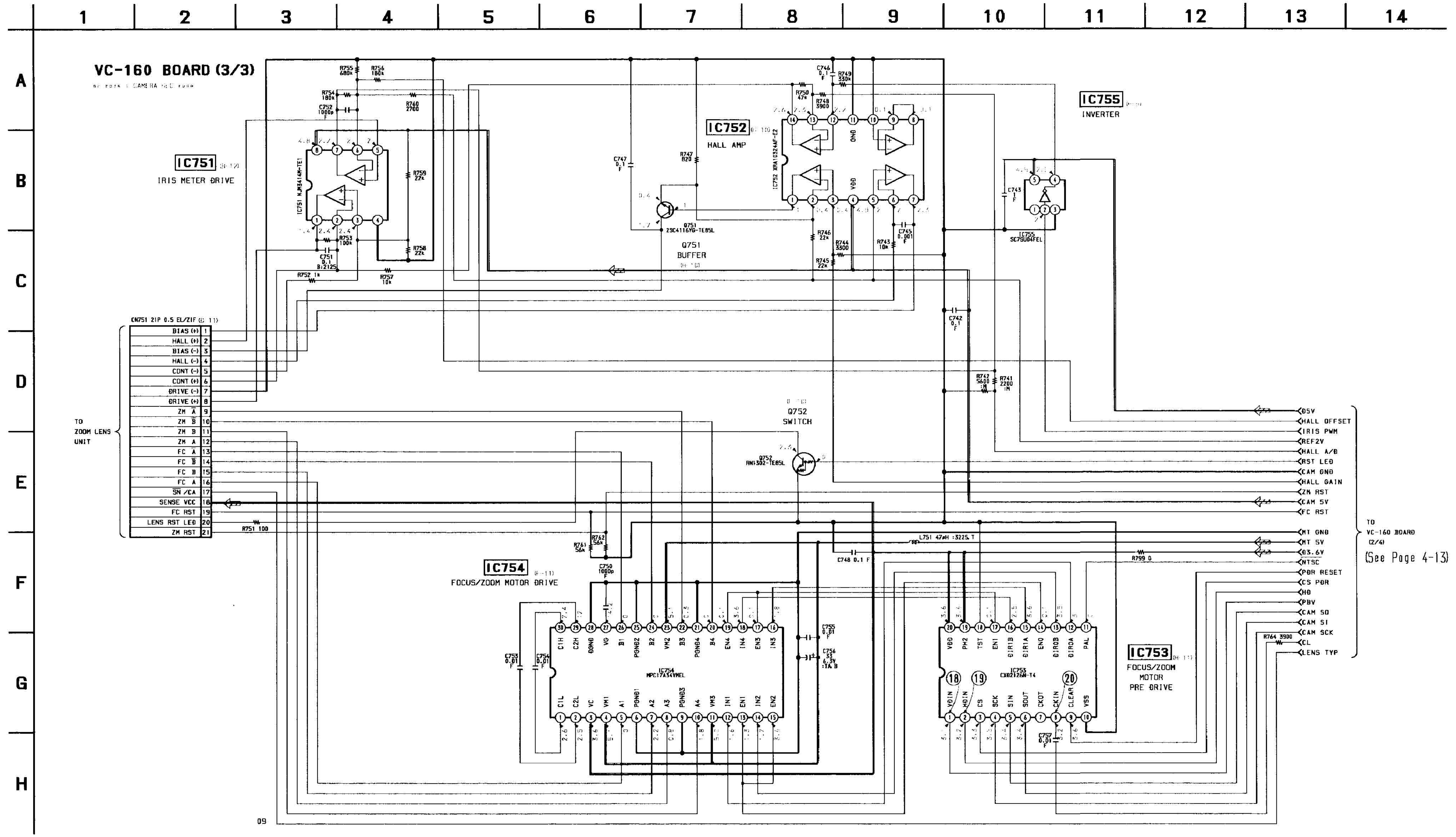
VC-160 BOARD (3/3)



VC-160 (LENS DRIVE) SCHEMATIC DIAGRAM

— Ref. No. VC-160 BOARD: 2,000 series —

- Refer to page 4–7 for Printed Wiring Board.

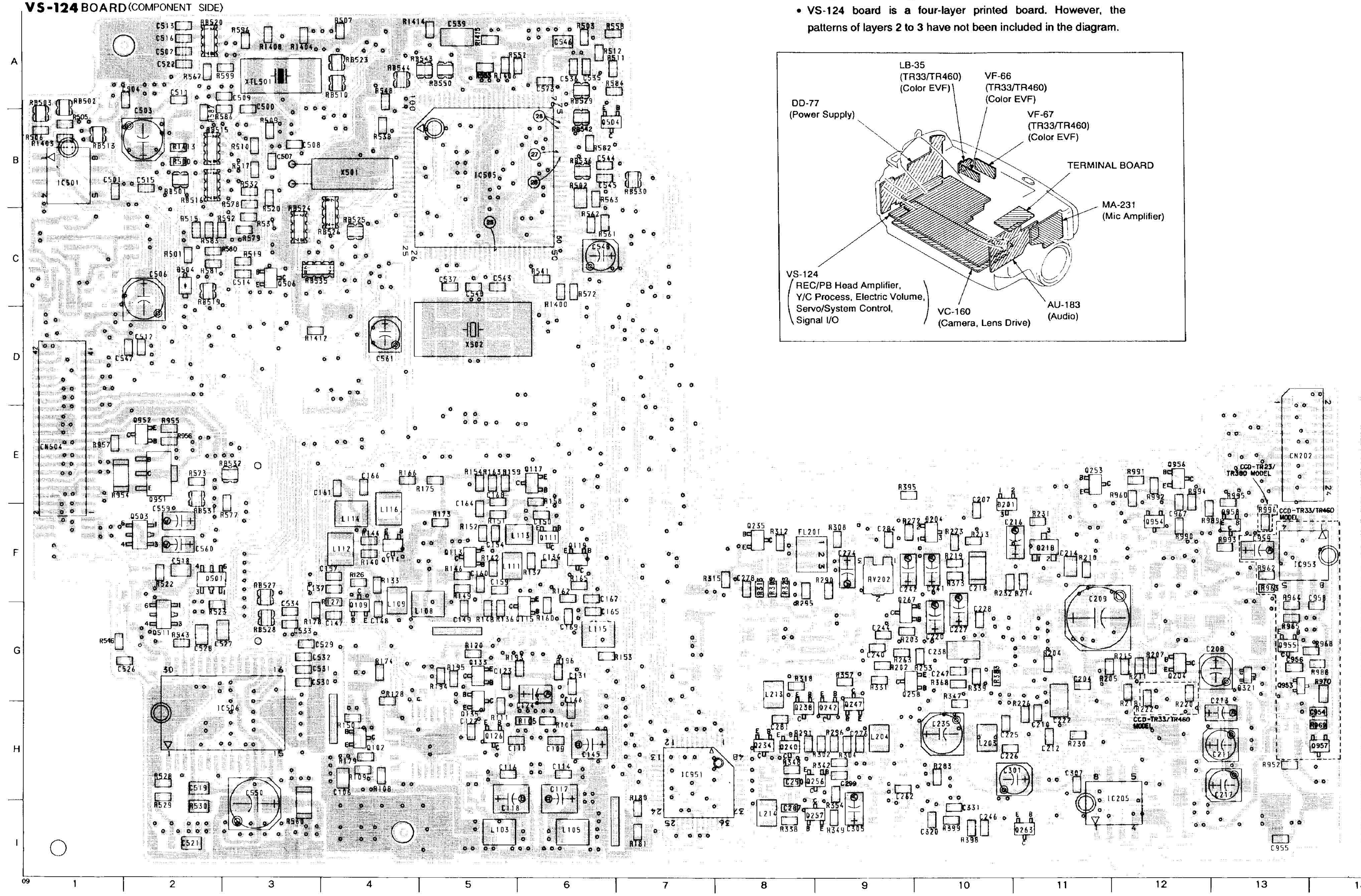

1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
VC-160 BOARD (3/3)
IC751
IRIS METER DRIVE
IC751 NJM3414M-TE1
IC752
HALL AMP
IC752 XRA10324AF-E2
GND
VDD
Q751
BUFFER
Q751 2SC4116YG-TE85L
IC755
INVERTER
IC755 SC7SU04FEL
Q752
SWITCH
Q752 RN1302-TE85L
IC754
FOCUS/ZOOM MOTOR DRIVE
IC754 MPC17A34VMEL
IC753
FOCUS/ZOOM MOTOR PRE DRIVE
IC753 CXD2126N-T4
C1H
C2H
DGND
VG
B1
PGND2
B2
VM2
B3
PGND4
B4
EN4
IN4
EN3
IN3
C1L
C2L
VC
VM1
A1
PGND1
A2
A3
PGND3
A4
VM3
IN1
EN1
IN2
EN2
VDD
PH2
TST
EN1
DIR1B
DIR1A
EN0
DIR0B
DIR0A
PAL
VDIN
HDIN
CS
SCK
SIN
SOUT
CKOT
CKIN
CLEAR
VSS
R755 680k
R756 180k
R754 180k
C752 1000p F
R760 2700
R759 22k
R758 22k
R753 100k
C751 0.1 B:2125
R752 1k
R757 10k
R751 100
C747 0.1 F
R747 820
C746 0.1 F
R749 330k
R750 47k
R748 3900
R746 22k
R744 3300
R745 22k
R743 10k
C745 0.001 F
C743 1 F
C742 0.1 F
R742 5600 :M
R741 2200 :M
L751 47μH :3225 T
C748 0.1 F
R799 0
R761 56k
R762 56k
C750 1000p F
C753 0.01 F
C754 0.01 F
C755 0.01 F
C756 33 6.3V :TA B
C757 0.01 F
R764 3900
CN751 21P 0.5 EL/ZIF
BIAS (+) 1
HALL (+) 2
BIAS (−) 3
HALL (−) 4
CONT (−) 5
CONT (+) 6
DRIVE (−) 7
DRIVE (+) 8
ZM Ā 9
ZM B̄ 10
ZM B 11
ZM A 12
FC Ā 13
FC B̄ 14
FC B 15
FC A 16
S̄N̄ /CA 17
SENSE VCC 18
FC RST 19
LENS RST LED 20
ZM RST 21
TO ZOOM LENS UNIT
D5V
HALL OFFSET
IRIS PWM
REF2V
HALL A/D
RST LED
CAM GND
HALL GAIN
ZM RST
CAM 5V
FC RST
MT GND
MT 5V
D3.6V
N̄T̄S̄C̄
POR RESET
CS POR
HD
PBV
CAM SO
CAM SI
CAM SCK
CL
LENS TYP
TO VC-160 BOARD (2/4)
(See Page 4-13)
⑱
⑲
⑳

CCD-TR23/TR33/TR380/TR380PK/TR460/TR460PK

VS-124 (REC/PB HEAD AMPLIFIER, Y/C PROCESS, ELECTRIC VOLUME, SERVO/SYSTEM CONTROL, SIGNAL I/O) PRINTED WIRING BOARD

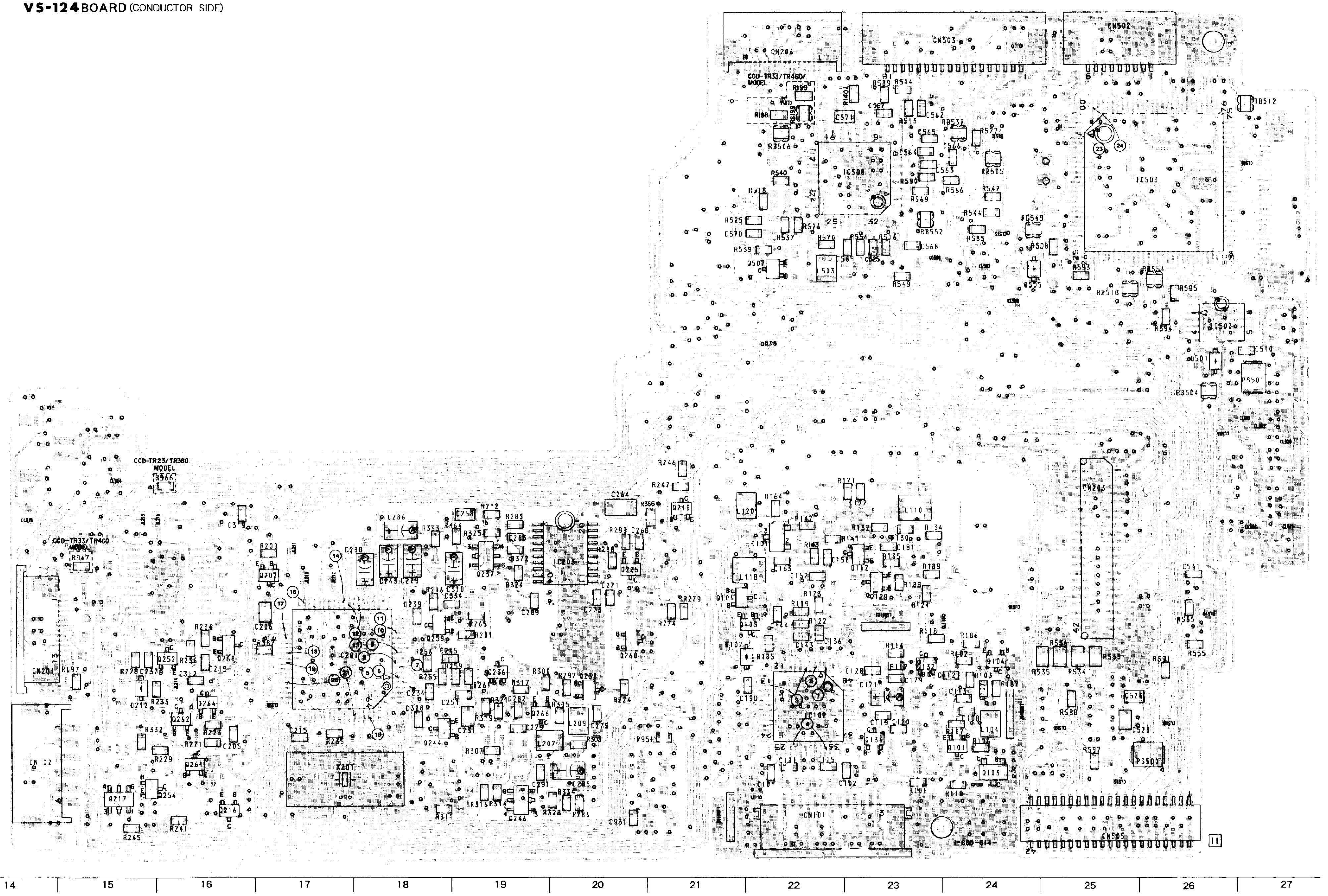
— Ref. No. VS-124 BOARD: 10,000 series —

- **For printed wiring boards.**
- VS-124 board is a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.



VS-124 BOARD (COMPONENT SIDE)

LB-35 (TR33/TR460) (Color EVF)
VF-66 (TR33/TR460) (Color EVF)
DD-77 (Power Supply)
VF-67 (TR33/TR460) (Color EVF)
TERMINAL BOARD
MA-231 (Mic Amplifier)
VS-124 (REC/PB Head Amplifier, Y/C Process, Electric Volume, Servo/System Control, Signal I/O)
VC-160 (Camera, Lens Drive)
AU-183 (Audio)
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8
9
10
11
12
13



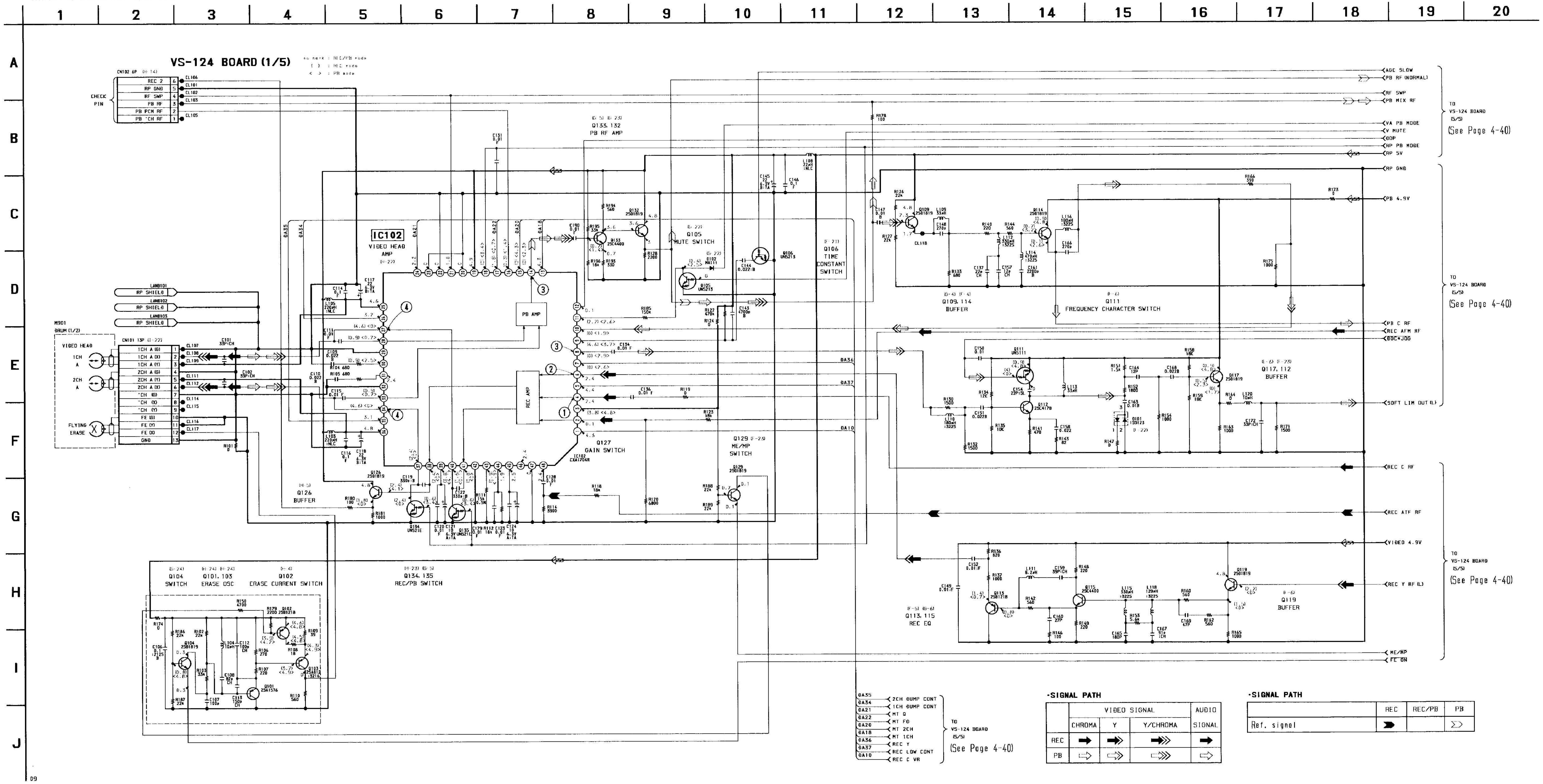
VS-124 BOARD (CONDUCTOR SIDE)

VS-124 BOARD

C101	H-22
C102	H-23
C106	H-4
C107	G-24
C108	H-24
C109	H-6
C110	H-6
C111	H-22
C112	G-24
C113	G-24
C114	H-6
C115	H-22
C116	H-5
C117	H-6
C118	H-5
C119	H-23
C120	H-23
C121	G-23
C122	H-5
C123	G-5
C124	G-6
C128	G-23
C131	G-6
C134	F-6
C136	G-22
C137	F-4
C143	G-22
C144	G-22
C145	H-6
C146	H-6
C147	G-4
C148	G-4
C149	G-5
C150	F-6
C151	F-23
C152	F-22
C154	F-5
C157	F-4
C158	F-22
C159	F-5
C160	F-5
C161	E-4
C163	F-22
C164	F-5
C165	G-6
C166	E-4
C167	F-6
C168	E-5
C169	G-6
C172	E-23
C179	G-23
C190	G-22
C204	G-11
C205	H-16
C206	G-17
C207	F-10
C208	G-13
C209	G-11
C210	H-11
C211	H-13
C212	H-11
C213	H-13
C214	F-11
C215	H-17
C216	F-11
C217	H-13
C218	F-10
C219	G-16
C220	G-10
C222	G-11
C225	H-10
C226	H-11
C227	G-10
C228	G-10
C229	F-18
C230	F-18
C231	H-19
C232	G-15
C234	G-18
C235	H-10
C238	G-10
C239	G-18
C240	G-9
C241	F-10
C242	F-10
C243	F-18
C244	G-9
C245	G-19
C246	I-10
C247	G-10
C251	G-19
C258	F-19
C262	H-9
C263	F-19
C264	F-20
C268	F-20
C271	F-20
C273	F-20
C274	F-9
C275	H-20
C276	H-9
C278	F-8
C279	H-19
C281	H-8
C282	H-19
C284	F-9
C285	H-20
C286	F-18
C287	I-8
C289	G-19
C290	H-8
C291	H-19
C299	H-9
C301	H-11
C305	I-9
C307	H-11
C310	F-19
C312	G-16
C319	F-16
C320	I-10
C328	H-18
C331	I-10
C334	G-19
C500	A-3
C501	B-1
C502	A-2
C503	B-2
C504	A-2
C506	C-2
C507	B-3
C508	B-3
C509	A-3
C510	D-27
C511	A-2
C512	D-2
C513	A-2
C514	C-3
C515	B-2
C516	A-2
C518	F-2
C519	H-2
C521	I-2
C522	A-2
C523	H-25
C524	G-26
C525	C-23
C526	G-2
C527	G-3
C528	G-2
C529	G-3
C530	G-3
C531	G-3
C532	G-3
C533	G-3
C534	G-3
C535	A-6
C536	A-6
C537	C-5
C539	A-5
C540	C-5
C541	F-26
C543	C-5
C544	B-6
C545	B-6
C546	A-6
C547	D-2
C548	C-6
C550	I-3
C559	F-2
C560	F-2
C561	D-4
C562	B-23
C563	B-23
C564	B-23
C565	B-23
C566	B-24
C567	B-23
C568	C-23
C569	C-23
C570	C-22
C571	B-23
C573	A-6
C951	I-20
C954	H-14
C955	I-13
C956	G-13
C958	G-14
C959	F-13
C967	F-12
CN101	I-22
CN102	H-14
CN201	G-14
CN202	E-13
CN203	F-25
CN206	A-22
CN502	A-25
CN503	A-24
CN504	E-1
CN505	I-25
D101	F-22
D102	G-22
D201	F-10
D204	F-10
D212	G-15
D218	F-11
D321	G-13
D501	D-26
D504	C-2
D505	C-25
FL201	F-9
IC102	H-22
IC201	G-17
IC203	F-20
IC205	I-12
IC501	B-1
IC502	D-26
IC503	B-26
IC505	B-5
IC506	H-3
IC508	B-23
IC951	G-7
IC953	F-14
L103	I-5
L104	H-24
L105	I-6
L108	G-5
L109	F-4
L110	F-23
L111	F-6
L112	F-4
L113	F-6
L114	F-4
L115	G-6
L116	F-4
L118	F-22
L120	F-22
L203	H-10
L204	H-9
L207	H-20
L209	H-20
L213	G-8
L214	I-8
L503	C-22
PS500	H-26
PS501	D-27
Q101	H-24
Q102	H-4
Q103	H-24
Q104	G-24
Q105	G-22
Q106	F-21
Q109	G-4
Q111	F-6
Q112	F-23
Q113	F-5
Q114	F-4
Q115	G-6
Q117	E-6
Q119	F-6
Q126	H-5
Q129	F-23
Q132	G-23
Q133	G-5
Q134	H-23
Q135	G-5
Q202	F-17
Q204	G-12
Q216	I-16
Q217	I-15
Q219	F-21
Q225	F-20
Q232	G-20
Q234	H-8
Q235	F-8
Q236	G-19
Q237	F-19
Q238	H-8
Q240	H-8
Q242	H-9
Q244	H-18
Q246	I-19
Q247	H-9
Q252	G-16
Q253	E-11
Q254	H-15
Q256	H-9
Q257	I-9
Q258	G-10
Q259	G-18
Q260	G-20
Q261	H-16
Q262	H-16
Q263	I-11
Q264	H-16
Q266	H-19
Q267	G-10
Q268	G-16
Q501	F-2
Q503	F-2
Q504	B-7
Q506	C-3
Q507	C-22
Q511	G-2
Q951	E-2
Q952	E-2
Q953	G-13
Q954	F-12
Q955	G-13
Q956	E-12
Q957	H-14
Q958	F-13
R101	H-23
R102	G-24
R103	G-24
R104	H-6
R105	H-6
R106	H-24
R107	H-24
R108	H-4
R109	H-4
R110	H-24
R111	H-5
R112	G-23
R114	G-23
R118	G-23
R119	G-22
R120	G-5
R122	G-22
R123	G-22
R124	F-23
R126	F-4
R127	F-4
R128	G-4
R130	F-23
R132	F-23
R133	F-4
R134	F-23
R135	F-23
R136	G-5
R137	F-6
R140	F-4
R141	F-22
R142	F-5
R143	F-22
R144	F-4
R146	F-5
R147	F-22
R148	G-5
R149	F-5
R150	H-4
R151	F-5
R152	F-5
R153	G-6
R154	E-5
R158	E-6
R159	E-5
R160	G-6
R162	F-6
R163	E-5
R164	F-22
R165	F-6
R166	E-4
R171	E-23
R173	F-5
R174	G-4
R175	E-5
R178	G-3
R179	H-4
R180	G-7
R181	G-7
R185	G-22
R186	G-24
R187	G-24
R188	F-23
R189	F-23
R193	G-6
R194	G-5
R195	G-5
R196	G-6
R197	G-15
R199	A-22
R201	G-19
R202	G-9
R203	G-10
R204	G-11
R205	G-12
R207	G-12
R209	F-17
R210	F-11
R211	G-12
R212	F-19
R213	F-10
R214	F-11
R215	G-12
R216	G-18
R218	G-12
R219	F-10
R220	G-12
R221	H-16
R222	G-12
R223	H-16
R224	G-20
R226	H-11
R228	G-15
R229	H-16
R230	H-11
R231	F-11
R232	F-11
R233	G-16
R234	G-16
R235	H-17
R236	G-16
R241	I-16
R245	I-15
R246	E-21
R247	E-21
R253	G-10
R255	G-18
R256	G-18
R259	G-19
R261	G-19
R263	G-9
R265	G-19
R272	F-10
R273	F-10
R274	G-21
R279	G-21
R283	H-10
R285	F-19
R286	I-20
R288	F-20
R289	F-20
R290	F-9
R291	H-8
R295	F-8
R296	H-9
R297	G-20
R300	G-20
R302	H-9
R303	H-20
R304	H-9
R305	H-20
R307	H-19
R308	F-9
R309	F-8
R311	I-18
R312	F-8
R313	F-8
R314	H-19
R315	F-8
R316	H-19
R317	G-19
R318	G-8
R319	H-19
R321	H-19
R322	F-19
R323	F-8
R324	F-19
R325	F-19
R328	I-20
R331	G-9
R332	H-15
R333	F-18
R334	I-20
R338	I-8
R339	G-10
R342	H-9
R347	H-10
R348	H-8
R349	I-9
R354	H-9
R357	G-9
R364	F-19
R366	F-21
R368	G-10
R373	F-10
R383	G-10
R387	G-17
R395	E-10
R398	I-10
R399	I-10
R500	B-2
R501	C-2
R502	B-6
R503	A-6
R505	B-1
R506	B-1
R507	A-4
R508	C-25
R509	B-3
R510	B-3
R511	A-7
R512	A-6
R513	B-23
R514	A-23
R515	C-2
R516	C-23
R517	B-3
R518	C-22
R519	C-3
R520	B-3
R522	F-2
R523	G-2
R525	C-22
R526	C-22
R527	B-24
R528	H-2
R529	H-2
R530	I-2
R531	C-3
R532	B-3
R533	G-25
R534	G-25
R535	G-25
R536	G-25
R537	C-22
R538	B-4
R539	C-22
R540	B-22
R541	C-6
R542	B-24
R543	G-2
R544	C-24
R546	G-1
R548	A-4
R549	C-23
R552	A-6
R553	A-5
R555	G-26
R556	C-23
R558	A-7
R560	I-3
R561	C-6
R562	C-6
R563	B-6
R565	G-26
R566	B-24
R567	A-2
R569	B-23
R570	C-22
R572	C-6
R573	E-2
R577	E-3
R578	B-3
R579	C-3
R580	C-2
R581	C-2
R582	B-6
R583	C-2
R584	A-7
R585	C-24
R586	A-3
R587	A-2
R588	H-25
R589	A-23
R590	B-23
R591	G-26
R592	C-3
R593	C-25
R594	D-26
R595	C-26
R596	A-3
R597	H-25
R599	A-3
R951	H-21
R952	H-13
R954	E-2
R955	E-2
R956	E-2
R957	E-1
R960	E-12
R962	F-13
R963	F-13
R964	G-13
R965	G-13
R966	E-16
R967	F-15
R968	G-14
R969	H-14
R970	G-14
R988	G-14
R989	F-13
R990	F-12
R991	E-12
R992	E-12
R993	F-13
R994	F-12
R995	F-13
R996	F-13
R1400	C-6
R1401	A-23
R1403	B-1
R1404	A-3
R1406	A-5
R1408	A-3
R1412	D-3
R1413	B-2
R1414	A-5
R1415	A-5
RB199	B-22
RB501	B-2
RB502	A-1
RB503	A-1
RB504	D-26
RB505	B-24
RB506	B-22
RB510	A-4
RB512	B-27
RB513	B-1
RB515	B-2
RB516	B-2
RB518	C-25
RB519	C-2
RB520	A-2
RB523	A-4
RB524	C-3
RB525	C-4
RB526	C-4
RB527	F-3
RB528	G-3
RB529	A-6
RB530	B-7
RB531	E-2
RB532	E-3
RB535	C-4
RB536	B-6
RB537	B-24
RB542	B-6
RB543	A-5
RB544	A-4
RB549	C-25
RB550	A-5
RB552	C-23
RB554	C-26
RV202	F-9
X201	H-17
X501	B-4
X502	D-5
XTL501	A-3

VS-124 (REC/PB HEAD AMPLIFIER) SCHEMATIC DIAGRAM

— Ref. No. VS-124 BOARD: 10,000 series —


VS-124 BOARD (1/5)
CHECK PIN
CN102 6P
REC 2
RP GND
RF SWP
PB RF
PB PCM RF
PB CH RF
M901 DRUM (1/2)
VIDEO HEAD
1CH A
2CH A
FLYING ERASE
CN101 13P
1CH A (G)
1CH A (X)
1CH A (Y)
2CH A (G)
2CH A (Y)
2CH A (X)
FE (G)
FE (Y)
FE (X)
GND
RP SHIELD
IC102 VIDEO HEAD AMP
PB AMP
REC AMP
IC102 CXA1724R
Q133, 132 PB RF AMP
Q105 MUTE SWITCH
Q106 TIME CONSTANT SWITCH
Q127 GAIN SWITCH
Q129 ME/MP SWITCH
Q126 BUFFER
Q104 SWITCH
Q101, 103 ERASE OSC
Q102 ERASE CURRENT SWITCH
Q134, 135 REC/PB SWITCH
Q109, 114 BUFFER
Q111 FREQUENCY CHARACTER SWITCH
Q117, 112 BUFFER
Q113, 115 REC EQ
Q119 BUFFER
AGC SLOW
PB RF (NORMAL)
RF SWP
PB MIX RF
VA PB MODE
V MUTE
DOP
RP PB MODE
RP 5V
RP GND
PB 4.9V
PB C RF
REC AFM RF
DOC*JOG
SOFT LIM OUT (L)
REC C RF
REC ATF RF
VIDEO 4.9V
REC Y RF (L)
ME/MP
FE ON
TO VS-124 BOARD (5/5) (See Page 4-40)
DA35 2CH DUMP CONT
DA34 1CH DUMP CONT
DA21 MT Q
DA22 MT FO
DA20 MT 2CH
DA18 MT 1CH
DA36 REC Y
DA37 REC LOW CONT
DA10 REC C VR
TO VS-124 BOARD (5/5) (See Page 4-40)
A B C D E F G H I J
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

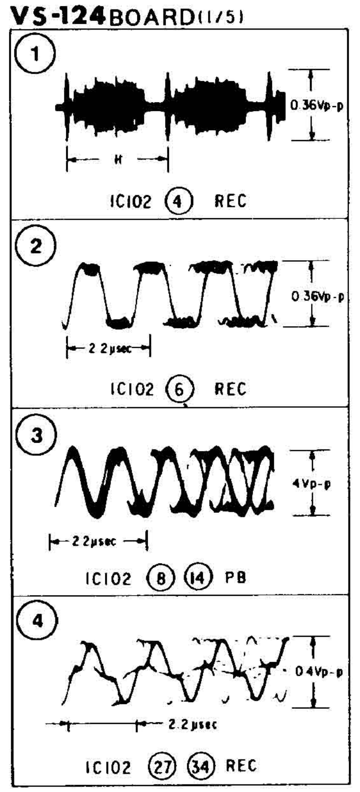
·SIGNAL PATH

	VIDEO SIGNAL			AUDIO
	CHROMA	Y	Y/CHROMA	SIGNAL
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

·SIGNAL PATH

	REC	REC/PB	PB
Ref. signal	➤		⪢

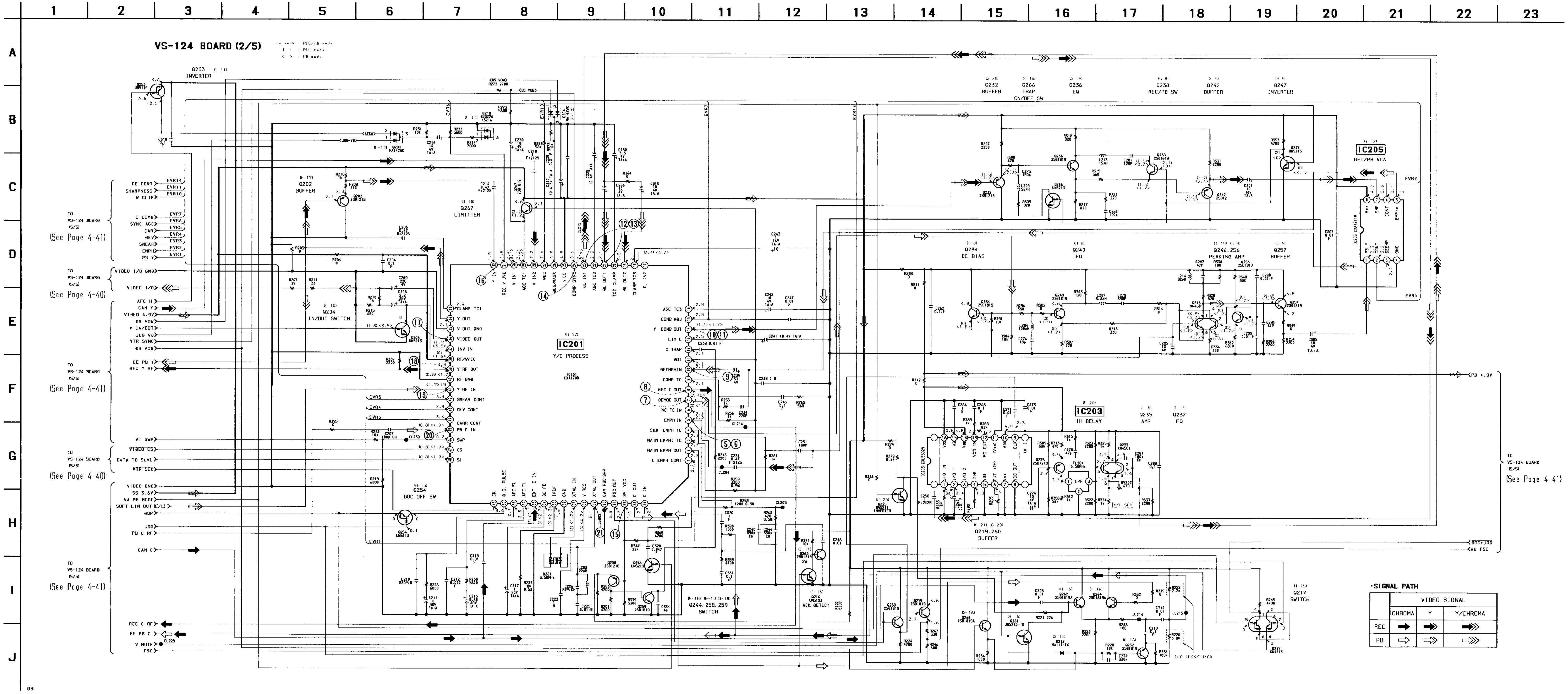
VS-124 BOARD (1/5)



VS-124 (Y/C PROCESS) SCHEMATIC DIAGRAM

— Ref. No. VS-124 BOARD: 10,000 series —

• Refer to page 4-22 for Printed Wiring Board.

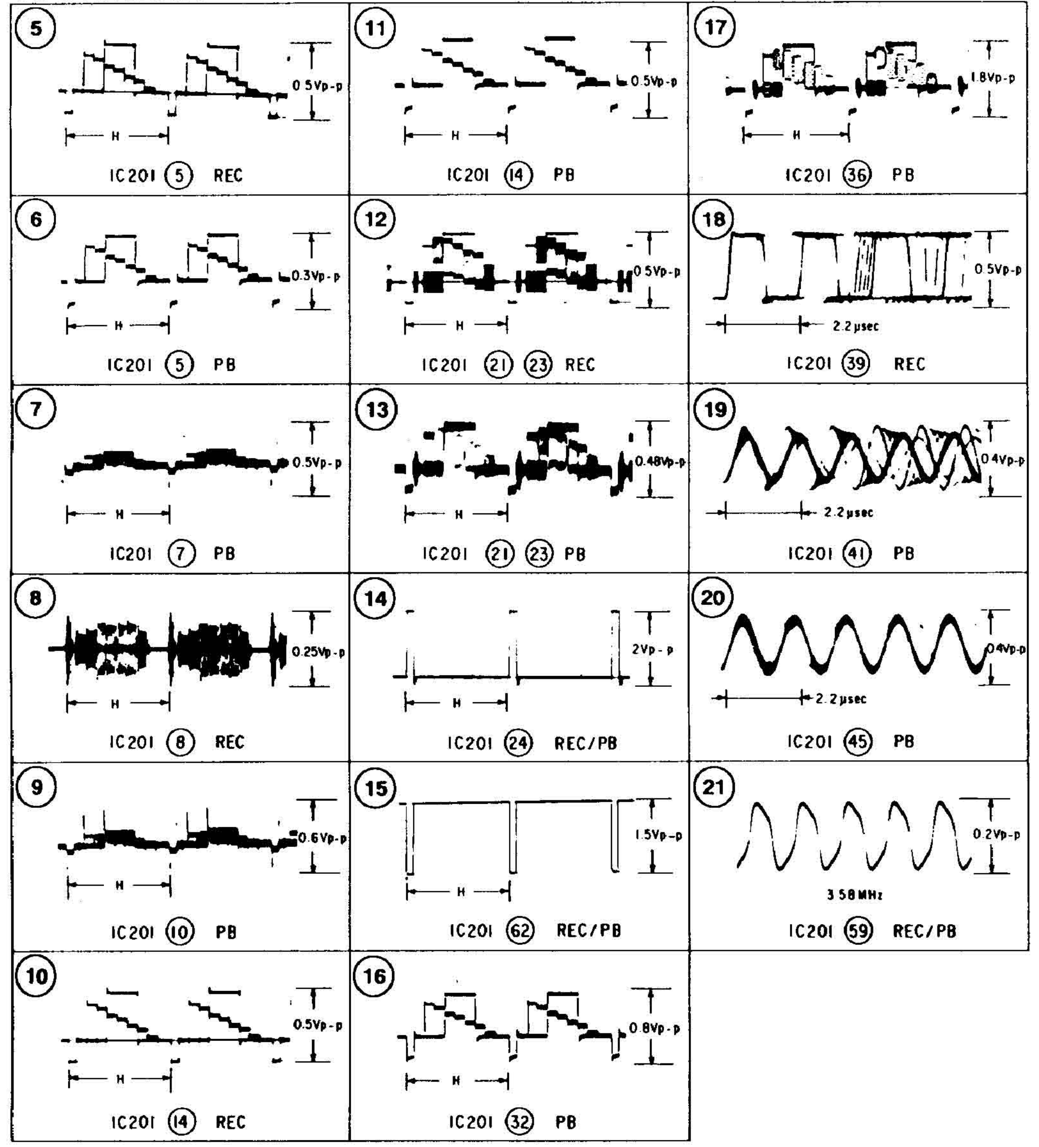


VS-124 BOARD (2/5)
Q253 INVERTER
Q202 BUFFER
Q267 LIMITTER
Q204 IN/OUT SWITCH
Q254 DOC OFF SW
IC201 Y/C PROCESS
CXA1700
Q244, 258, 259 SWITCH
Q216 ACK DETECT
Q232 BUFFER
Q266 TRAP ON/OFF SW
Q236 EQ
Q238 REC/PB SW
Q242 BUFFER
Q247 INVERTER
IC205 REC/PB VCA
Q234 DC BIAS
Q240 EQ
Q246, 256 PEAKING AMP
Q257 BUFFER
IC203 1H DELAY
Q235 AMP
Q237 EQ
Q219, 260 BUFFER
Q217 SWITCH
Q225 INVERTER
TO VS-124 BOARD (5/5) (See Page 4-41)
TO VS-124 BOARD (5/5) (See Page 4-40)
TO VS-124 BOARD (5/5) (See Page 4-40)
TO VS-124 BOARD (5/5) (See Page 4-41)
TO VS-124 BOARD (5/5) (See Page 4-41)
TO VS-124 BOARD (5/5) (See Page 4-41)
EE CONT
SHARPNESS
W CLIP
C COMB
SYNC AGC
CAR
BEV
SMEAR
EMPH
PB Y
VIDEO I/O GND
VIDEO I/O
AFC H
CAM Y
VIDEO 4.9V
DS VDW
V IN/OUT
JOG VD
VTR SYNC
DS VDB
EE PB Y
REC Y RF
VI SWP
VIDEO CS
DATA TO SLVE
VTR SCK
VIDEO GND
SS 3.6V
VA PB MODE
SOFT LIM OUT
DOP
JOG
PB C RF
CAM C
REC C RF
EE PB C
V MUTE
FSC
PB 4.9V
DOC*JOG
AU FSC
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
A B C D E F G H I J

• SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	➡»	➡⋙
PB	⇨	⇨»	⇨⋙

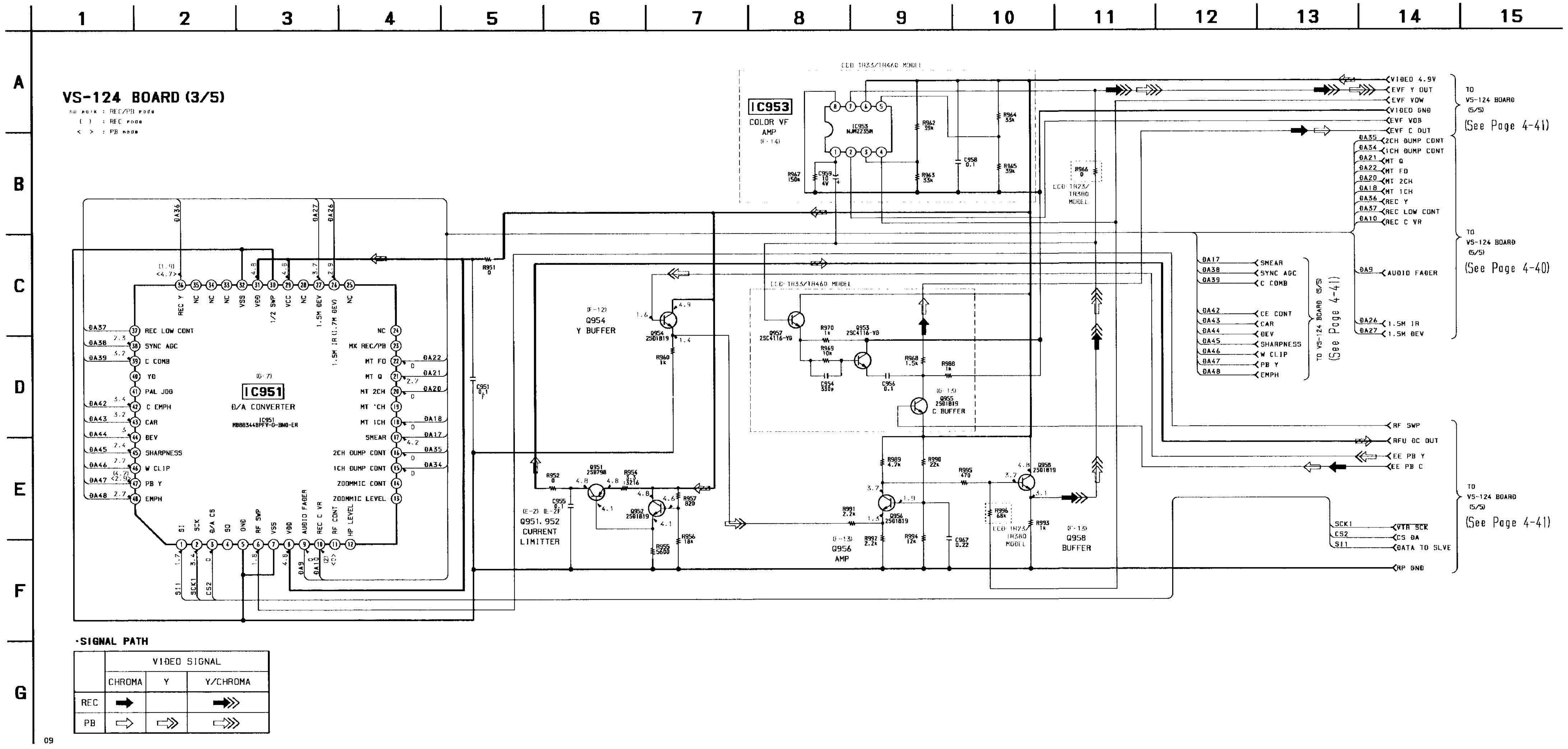
VS-124 BOARD (2/5)



VS-124 (ELECTRIC VOLUME) SCHEMATIC DIAGRAM

• Refer to page 4-22 for Printed Wiring Board.

— Ref. No. VS-124 BOARD: 10,000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
VS-124 BOARD (3/5)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
IC951
D/A CONVERTER
(G-7)
IC951
MB88344BPFV-G-BND-ER
REC Y
NC
VSS
VDD
1/2 SWP
VCC
1.5M DEV
1.5M IR(1.7M DEV)
REC LOW CONT
SYNC AGC
C COMB
YD
PAL JOG
C EMPH
CAR
DEV
SHARPNESS
W CLIP
PB Y
EMPH
MX REC/PB
MT FO
MT Q
MT 2CH
MT 1CH
SMEAR
2CH DUMP CONT
1CH DUMP CONT
ZOOMMIC CONT
ZOOMMIC LEVEL
SI
SCK
D/A CS
SO
GND
RF SWP
AUDIO FADER
REC C VR
RF CONT
HP LEVEL
SI1
SCK1
CS2
R951
0
C951
0.1
F
IC953
COLOR VF
AMP
(F-14)
IC953
NJM2235M
R962
39k
R963
33k
R964
33k
R965
39k
C958
0.1
R967
150k
C959
10
4V
R966
0
CCD-TR33/TR460 MODEL
CCD-TR23/TR380 MODEL
(F-12)
Q954
Y BUFFER
Q954
2SD1819
R960
1k
Q957
2SC4116-YG
Q953
2SC4116-YG
R970
1k
R969
10k
C954
330p
C956
0.1
R968
1.5k
R988
1k
(G-13)
Q955
2SD1819
C BUFFER
Q951
2SB798
Q952
2SD1819
R952
0
R954
3.3
:3216
R957
820
R956
18k
R955
5600
C955
0.1
(E-2) (E-2F
Q951, 952
CURRENT
LIMITTER
R989
4.7k
R990
22k
R995
470
R991
2.2k
R992
2.2k
R994
12k
C967
0.22
Q956
2SD1819
(F-13)
Q956
AMP
R996
68k
Q958
2SD1819
R993
1k
(F-13)
Q958
BUFFER
VIDEO 4.9V
EVF Y OUT
EVF VOW
VIDEO GND
EVF VOB
EVF C OUT
DA35
2CH DUMP CONT
DA34
1CH DUMP CONT
DA21
MT Q
DA22
MT FO
DA20
MT 2CH
DA18
MT 1CH
DA36
REC Y
DA37
REC LOW CONT
DA10
REC C VR
DA9
AUDIO FADER
DA26
1.5M IR
DA27
1.5M DEV
TO
VS-124 BOARD
(5/5)
(See Page 4-41)
TO
VS-124 BOARD
(5/5)
(See Page 4-40)
DA17
SMEAR
DA38
SYNC AGC
DA39
C COMB
DA42
CE CONT
DA43
CAR
DA44
DEV
DA45
SHARPNESS
DA46
W CLIP
DA47
PB Y
DA48
EMPH
TO VS-124 BOARD (5/5)
(See Page 4-41)
RF SWP
RFU DC OUT
EE PB Y
EE PB C
SCK1
CS2
SI1
VTR SCK
CS DA
DATA TO SLVE
RP GND
TO
VS-124 BOARD
(5/5)
(See Page 4-41)
09

·SIGNAL PATH

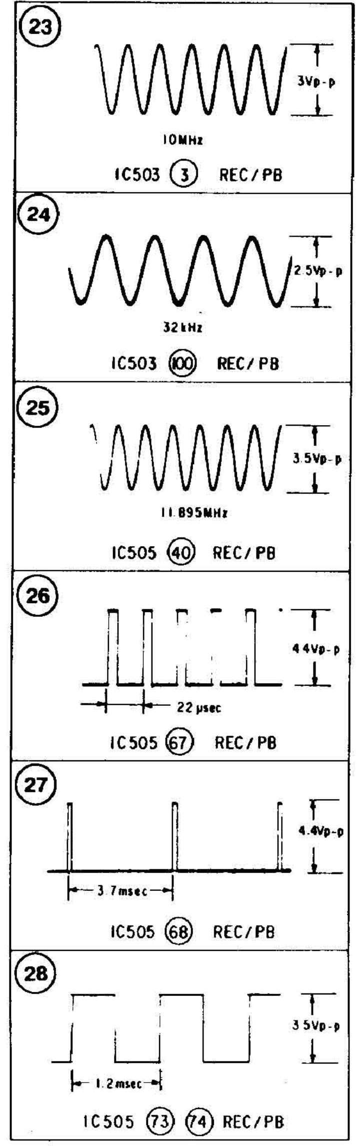
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡		➡»
PB	⇨	⇨»	⇨»

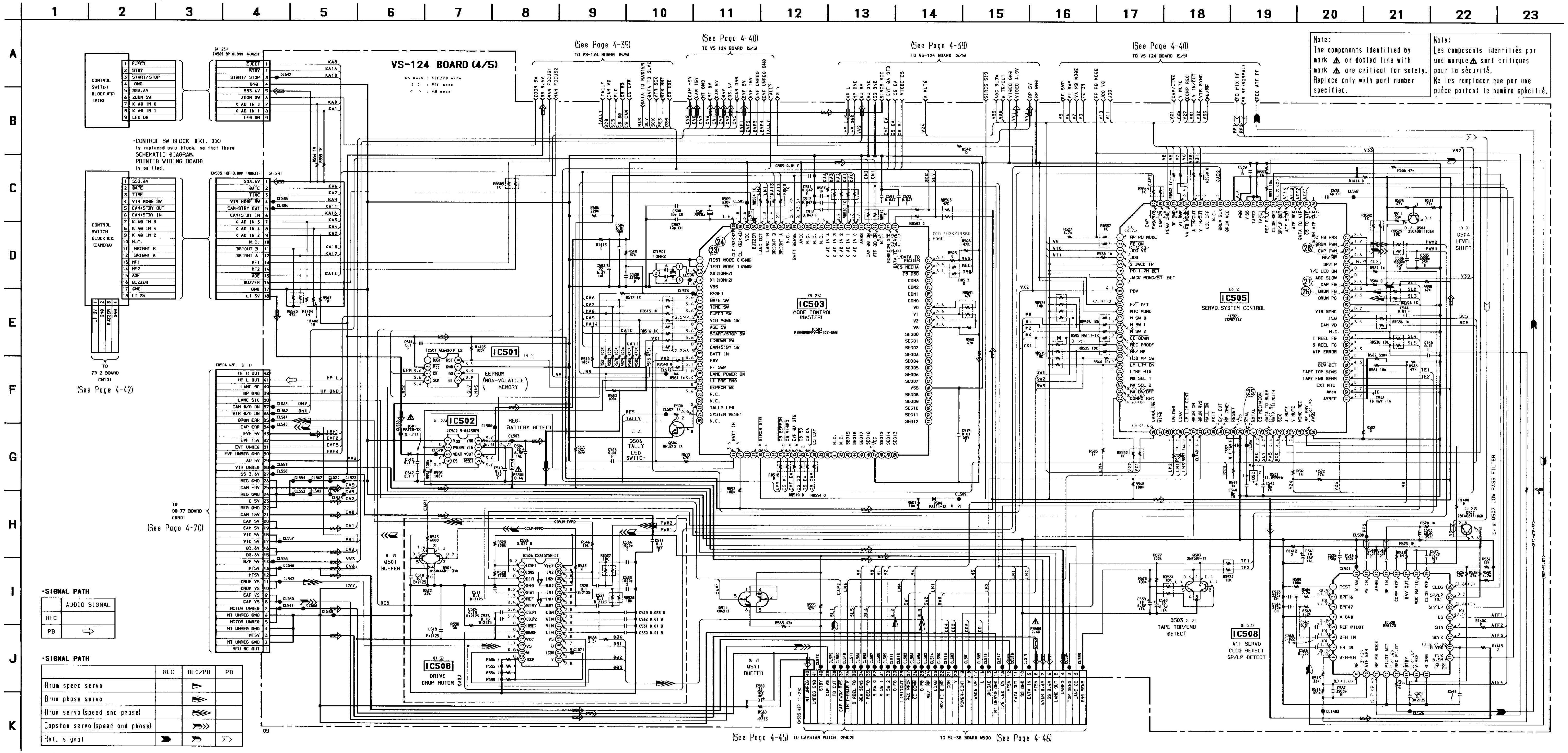
VS-124 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

— Ref. No. VS-124 BOARD: 10,000 series —

- Refer to page 4-22 for Printed Wiring Board.

VS-124BOARD (4/5)




1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
K
VS-124 BOARD (4/5)
CONTROL SWITCH BLOCK (FK) (VTR)
CONTROL SWITCH BLOCK (CK) (CAMERA)
•CONTROL SW BLOCK (FK), (CK) is replaced as a block, so that there SCHEMATIC DIAGRAM, PRINTED WIRING BOARD is omitted.
TO ZB-2 BOARD CN101
(See Page 4-42)
TO DD-77 BOARD CN901
(See Page 4-70)
(See Page 4-39) TO VS-124 BOARD (5/5)
(See Page 4-40) TO VS-124 BOARD (5/5)
(See Page 4-39) TO VS-124 BOARD (5/5)
(See Page 4-40) TO VS-124 BOARD (5/5)
IC501 EEPROM (NON-VOLATILE MEMORY)
IC502 REG. BATTERY DETECT
IC503 MODE CONTROL (MASTER)
IC505 SERVO, SYSTEM CONTROL
IC506 DRIVE DRUM MOTOR
IC508 ATF SERVO CLOG DETECT SP/LP DETECT
Q501 BUFFER
Q503 TAPE TOP/END DETECT
Q504 LEVEL SHIFT
Q506 TALLY LED SWITCH
Q507 LOW PASS FILTER
Q511 BUFFER
(See Page 4-45) TO CAPSTAN MOTOR M902
TO SL-38 BOARD W500 (See Page 4-46)

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

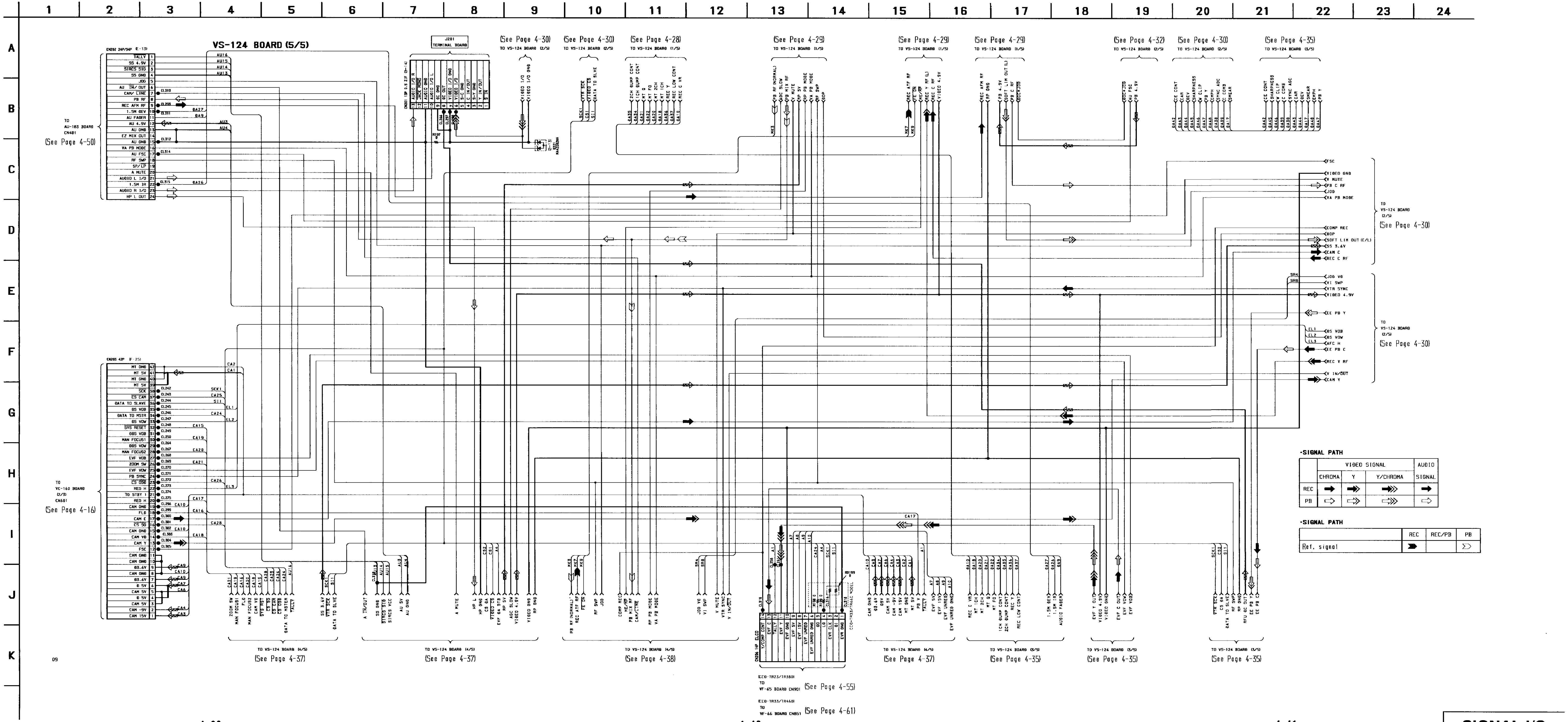
·SIGNAL PATH

	AUDIO SIGNAL
REC	
PB	⇨

·SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▻	
Drum phase servo		▻>	
Drum servo (speed and phase)		▻>>	
Capstan servo (speed and phase)		➢>>	
Ref. signal	➤	➢	⟩⟩

• Refer to page 4-22 for Printed Wiring Board.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
A B C D E F G H I J K
VS-124 BOARD (5/5)
CN202 24P/34P (E-13)
TALLY 1
SS 4.9V 2
SIRCS SIG 3
SS GND 4
JOG 5
AU IN/OUT 6
CAM/LINE 7
PB RF 8
REC AFM RF 9
1.5M DEV 10
AU FADER 11
AU 4.9V 12
AU GND 13
EZ MIX OUT 14
AU GND 15
VA PB MODE 16
AU FSC 17
RF SWP 18
SP/LP 19
A MUTE 20
AUDIO L I/O 21
1.5M IR 22
AUDIO R I/O 23
HP L OUT 24
TO AU-183 BOARD CN401
(See Page 4-50)
CN203 42P (F-25)
MT GND 42
MT 5V 41
MT GND 40
MT 5V 39
SCK 38
CS CAM 37
DATA TO SLAVE 36
DS VOB 35
DATA TO MSTR 34
DS VOW 33
SYS RESET 32
DDS VOB 31
MAN FOCUS1 30
DDS VOW 29
MAN FOCUS2 28
EVF VOB 27
ZOOM SW 26
EVF VOW 25
PB SYNC 24
CS OSD 23
REG H 22
TG STBY 1 21
REG H 20
CAM GND 19
FLD 18
CAM C 17
CS SG 16
CAM GND 15
CAM VD 14
CAM Y 13
FSC 12
CAM GND 11
CAM GND 10
D3.6V 9
CAM GND 8
D3.6V 7
D 5V 6
CAM 5V 5
D 5V 4
CAM 5V 3
CAM -9V 2
CAM 15V 1
TO VC-160 BOARD (2/3) CN601
(See Page 4-16)
J201 TERMINAL BOARD
(See Page 4-30) TO VS-124 BOARD (2/5)
(See Page 4-30) TO VS-124 BOARD (2/5)
(See Page 4-28) TO VS-124 BOARD (1/5)
(See Page 4-29) TO VS-124 BOARD (1/5)
(See Page 4-29) TO VS-124 BOARD (1/5)
(See Page 4-29) TO VS-124 BOARD (1/5)
(See Page 4-32) TO VS-124 BOARD (2/5)
(See Page 4-30) TO VS-124 BOARD (2/5)
(See Page 4-35) TO VS-124 BOARD (5/5)
TO VS-124 BOARD (2/5) (See Page 4-30)
TO VS-124 BOARD (2/5) (See Page 4-30)
TO VS-124 BOARD (4/5) (See Page 4-37)
TO VS-124 BOARD (4/5) (See Page 4-37)
TO VS-124 BOARD (4/5) (See Page 4-38)
CN206 14P ELCD
(CCD-TR23/TR380) TO VF-65 BOARD CN901 (See Page 4-55)
(CCD-TR33/TR460) TO VF-66 BOARD CN851 (See Page 4-61)
TO VS-124 BOARD (4/5) (See Page 4-37)
TO VS-124 BOARD (3/5) (See Page 4-35)
TO VS-124 BOARD (3/5) (See Page 4-35)
TO VS-124 BOARD (3/5) (See Page 4-35)
09

-SIGNAL PATH

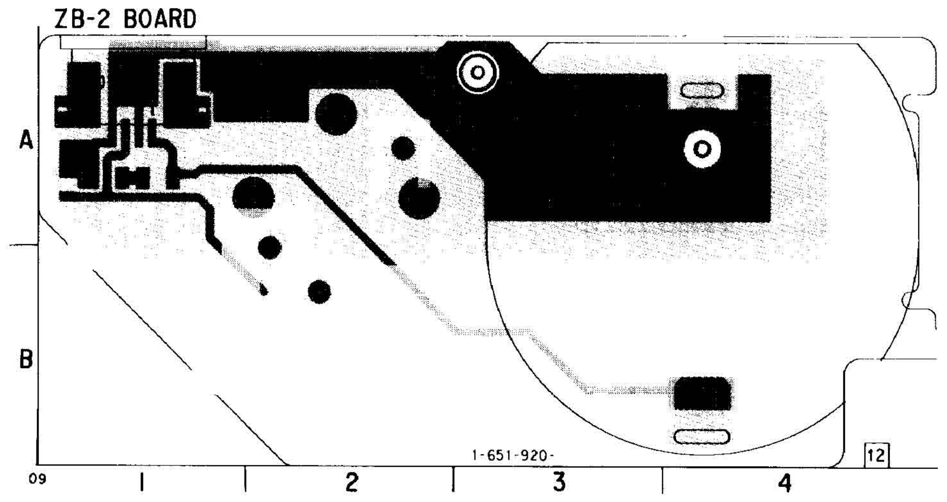
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡》	➡》》	➡
PB	⇨	⇨》	⇨》》	⇨

-SIGNAL PATH

	REC	REC/PB	PB
Ref. signal	➧		⇨

ZB-2 (LITHIUM BATTERY) PRINTED WIRING BOARD

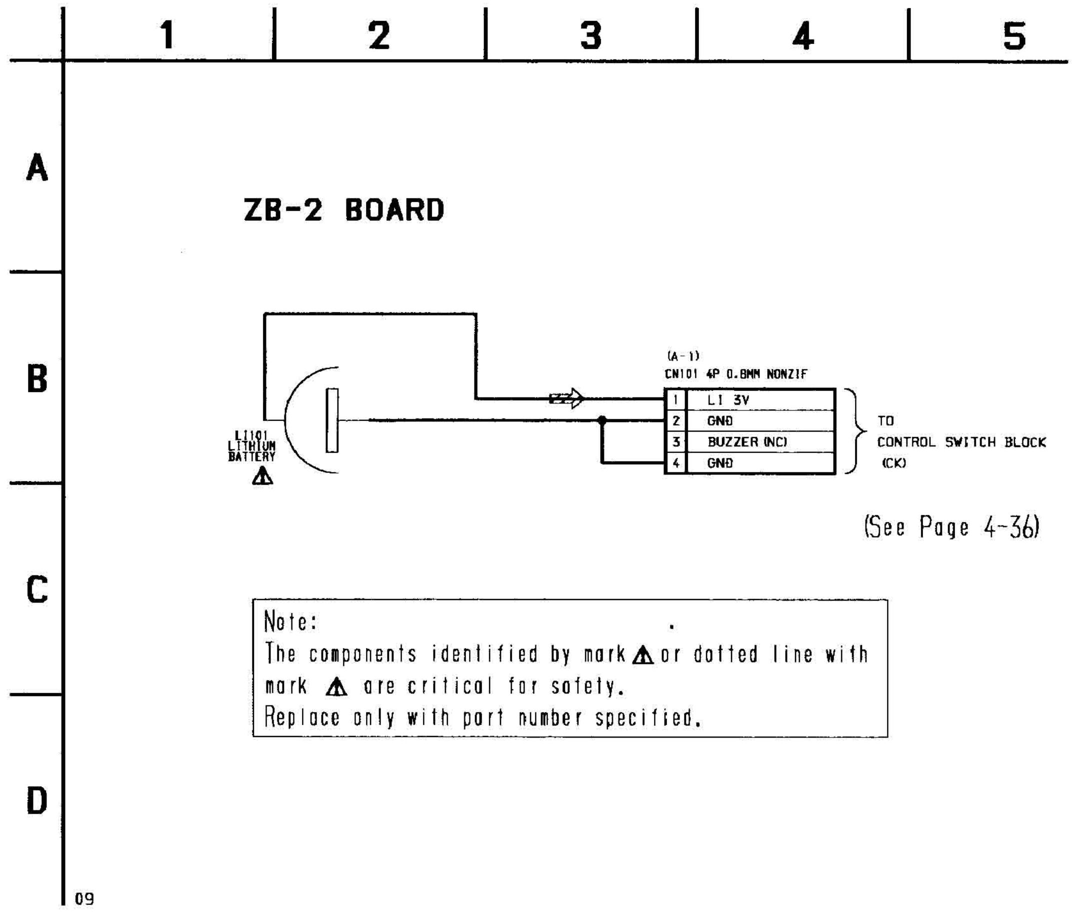
— Ref. No. ZB-2 BOARD: 3,000 series —


ZB-2 BOARD
A
B
1-651-920-
12
09
1
2
3
4

ZB-2 (LITHIUM BATTERY) SCHEMATIC DIAGRAM

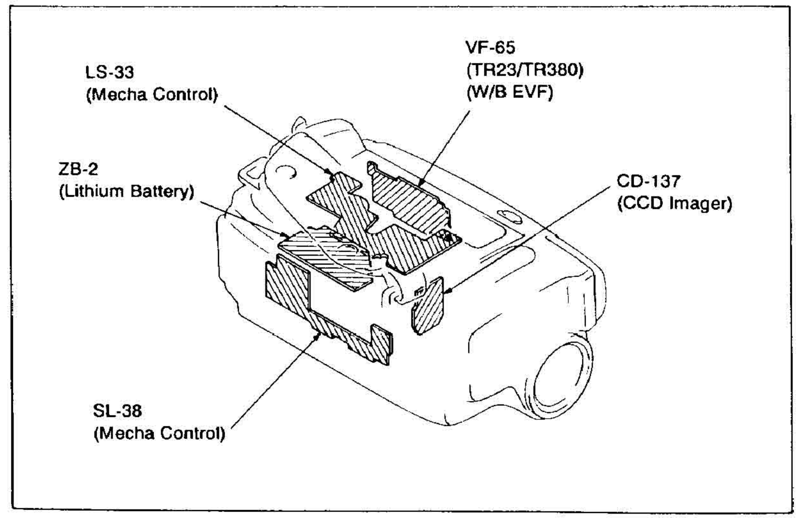
— Ref. No. ZB-2 BOARD: 3,000 series —

- **For printed wiring board of ZB-2 board.**
- ▨ : Pattern from the side which enable seeing.
- ░ : Pattern of the rear side.


1
2
3
4
5
A
B
C
D
ZB-2 BOARD
(A-1)
CN101 4P 0.8MM NONZIF
1 LI 3V
2 GND
3 BUZZER (NC)
4 GND
TO CONTROL SWITCH BLOCK (CK)
LI101 LITHIUM BATTERY
09

(See Page 4-36)

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.


LS-33
(Mecha Control)
VF-65
(TR23/TR380)
(W/B EVF)
ZB-2
(Lithium Battery)
CD-137
(CCD Imager)
SL-38
(Mecha Control)

SL-38 (MECHA CONTROL) PRINTED WIRING BOARD

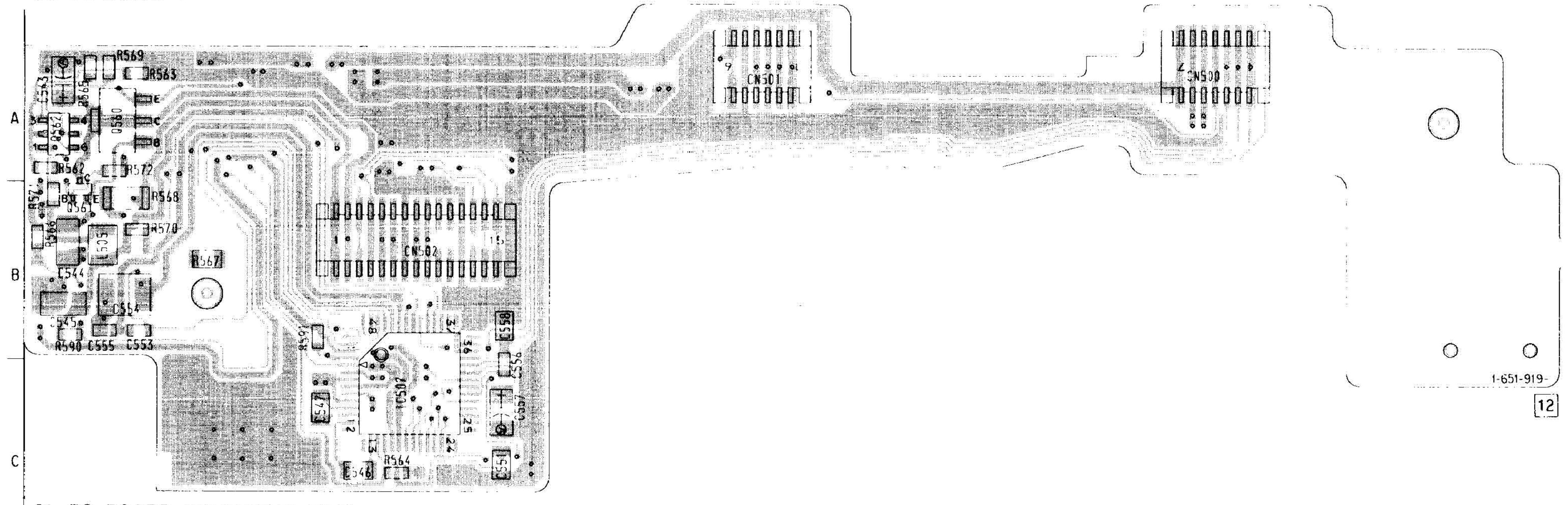
— Ref. No. SL-38 BOARD: 3,000 series, LS-33 BOARD: 6,000 series —

- Printed wiring boards of FP-442, LM-40 and LS-33 boards are omitted.

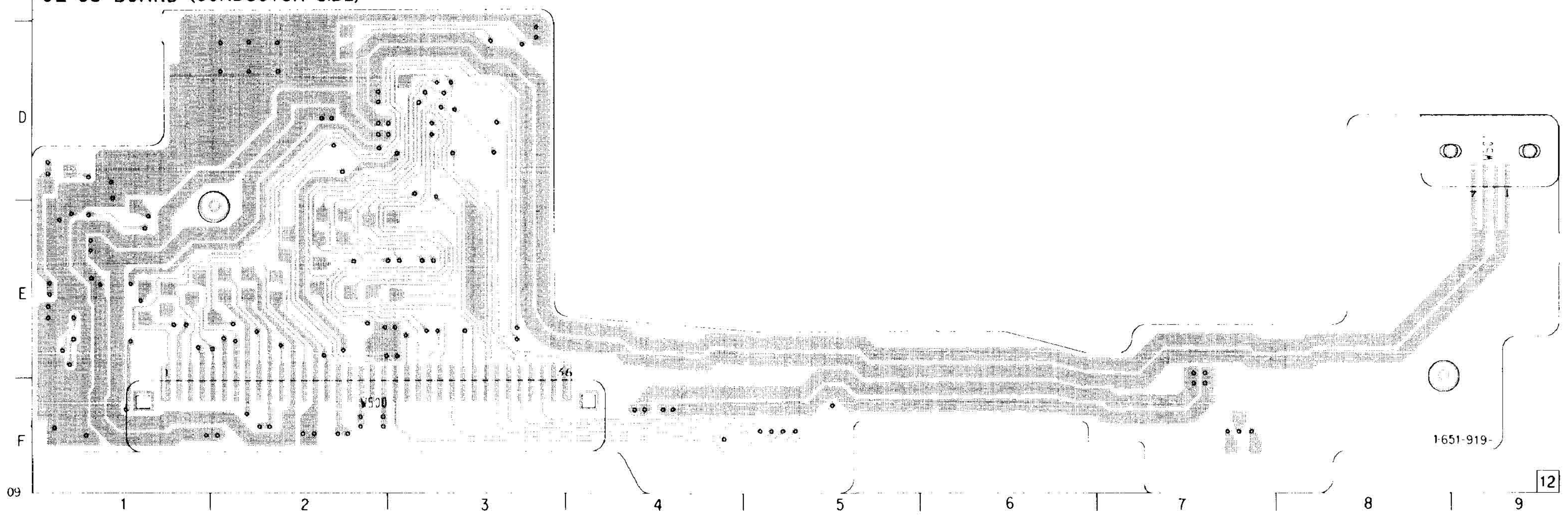
SL-38 BOARD

C543	A-1
C544	B-1
C545	B-1
C546	C-2
C547	C-2
C551	C-3
C553	B-1
C554	B-1
C555	B-1
C556	C-3
C557	C-3
C558	B-3
CN500	A-7
CN501	A-5
CN502	B-3
IC507	C-3
L505	B-1
Q560	A-1
Q561	B-1
Q562	A-1
R562	A-1
R563	A-1
R564	C-3
R565	A-1
R566	B-1
R567	B-2
R568	B-1
R569	A-1
R570	B-1
R571	B-1
R572	A-1
R590	B-1
R591	B-2
W500	F-2
W501	D-9

SL-38 BOARD (COMPONENT SIDE)

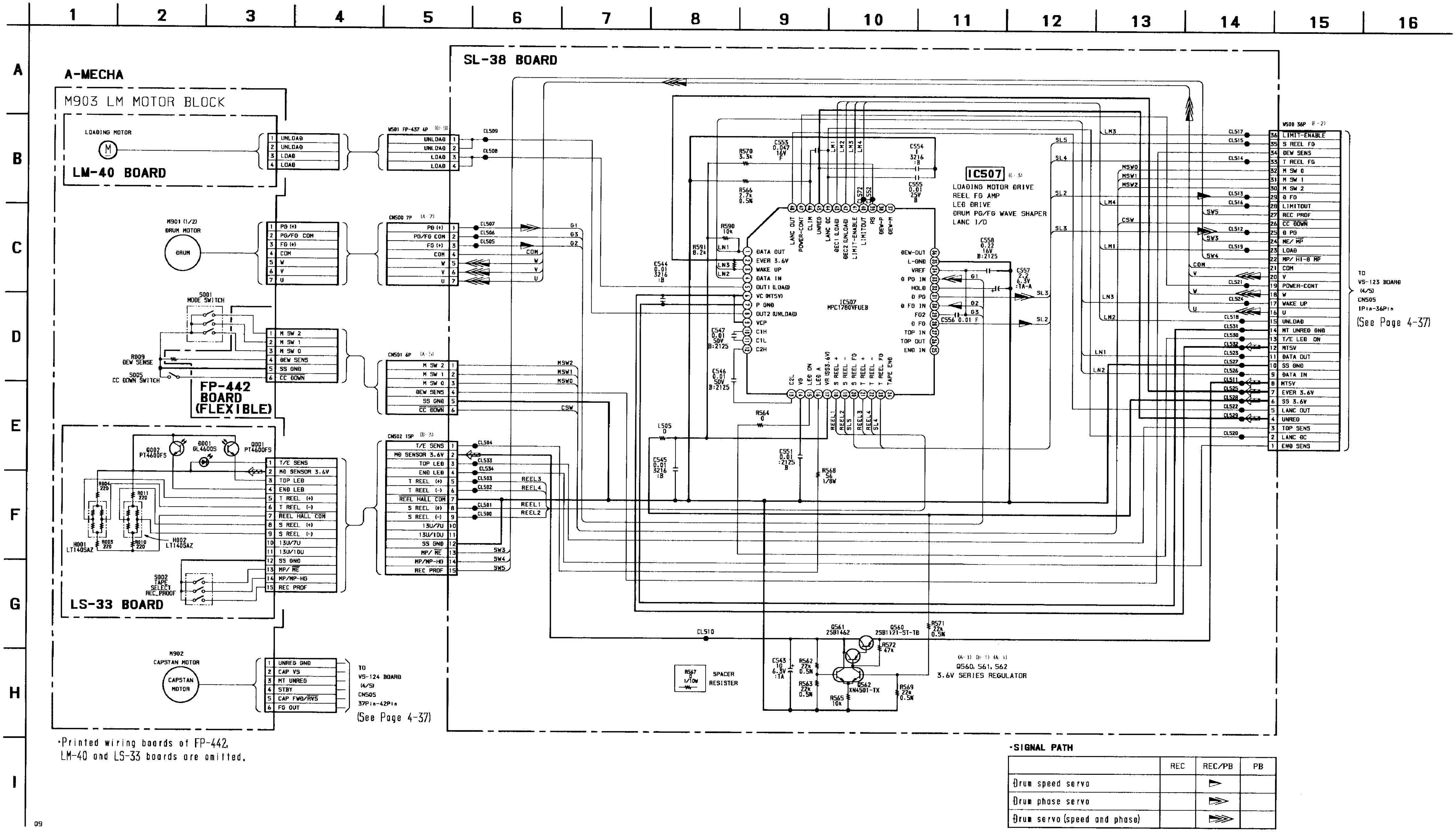

A
B
C
R569
R563
R568
R567
R570
C554
C555
C544
R590
CN501
CN500
CN502
IC507
R564
1-651-919-
12

SL-38 BOARD (CONDUCTOR SIDE)


D
E
F
W500
09
1
2
3
4
5
6
7
8
9
1-651-919-
12

SL-38 (MECHA CONTROL), FP-442 (MODE SWITCH), LM-40 (LOADING MOTOR), LS-33 (TAPE SENSOR) SCHEMATIC DIAGRAM

— Ref. No. SL-38 BOARD: 3,000 series, LS-33 BOARD: 6,000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
A-MECHA
M903 LM MOTOR BLOCK
LOADING MOTOR
LM-40 BOARD
UNLOAD
UNLOAD
LOAD
LOAD
M901 (1/2)
DRUM MOTOR
DRUM
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
S001
MODE SWITCH
R009
DEW SENSE
S005
CC DOWN SWITCH
M SW 2
M SW 1
M SW 0
DEW SENS
SS GND
CC DOWN
FP-442
BOARD
(FLEXIBLE)
Q002
PT4600FS
D001
GL4600S
Q001
PT4600FS
H001
LT1405AZ
H002
LT1405AZ
T/E SENS
MD SENSOR 3.6V
TOP LED
END LED
T REEL (+)
T REEL (-)
REEL HALL COM
S REEL (+)
S REEL (-)
13V/7U
13V/10U
SS GND
MP/ ME
MP/MP-HG
REC PROF
S002
TAPE SELECT
REC PROOF
LS-33 BOARD
M902
CAPSTAN MOTOR
CAPSTAN MOTOR
UNREG GND
CAP VS
MT UNREG
STBY
CAP FWD/RVS
FG OUT
TO
VS-124 BOARD
(4/5)
CN505
37Pin-42Pin
(See Page 4-37)
SL-38 BOARD
W501 FP-437 4P
CN500 7P
CN501 6P
CN502 15P
IC507
LOADING MOTOR DRIVE
REEL FG AMP
LED DRIVE
DRUM PG/FG WAVE SHAPER
LANC I/O
IC507
MPC1780VFUEB
DATA OUT
EVER 3.6V
WAKE UP
DATA IN
OUT1 (LOAD)
VC (MT5V)
P GND
OUT2 (UNLOAD)
VCP
C1H
C1L
C2H
DEW-OUT
L-GND
VREF
D PG IN
HOLD
D PG
D FG IN
FG2
D FG
TOP IN
TOP OUT
END IN
Q561
2SB1462
Q560
2SB1121-ST-TB
Q562
XN4501-TX
Q560, 561, 562
3.6V SERIES REGULATOR
R567
0
1/10W
SPACER
RESISTER
W500 36P
LIMIT-ENABLE
S REEL FG
DEW SENS
T REEL FG
M SW 0
M SW 1
M SW 2
D FG
LIMITOUT
REC PROF
CC DOWN
D PG
ME/ MP
LOAD
MP/ HI-8 MP
COM
V
POWER-CONT
W
WAKE UP
U
UNLOAD
MT UNREG GND
T/E LED ON
MT5V
DATA OUT
SS GND
DATA IN
MT5V
EVER 3.6V
SS 3.6V
LANC OUT
UNREG
TOP SENS
LANC DC
END SENS
TO
VS-123 BOARD
(4/5)
CN505
1Pin-36Pin
(See Page 4-37)

•Printed wiring boards of FP-442, LM-40 and LS-33 boards are omitted.

•SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	

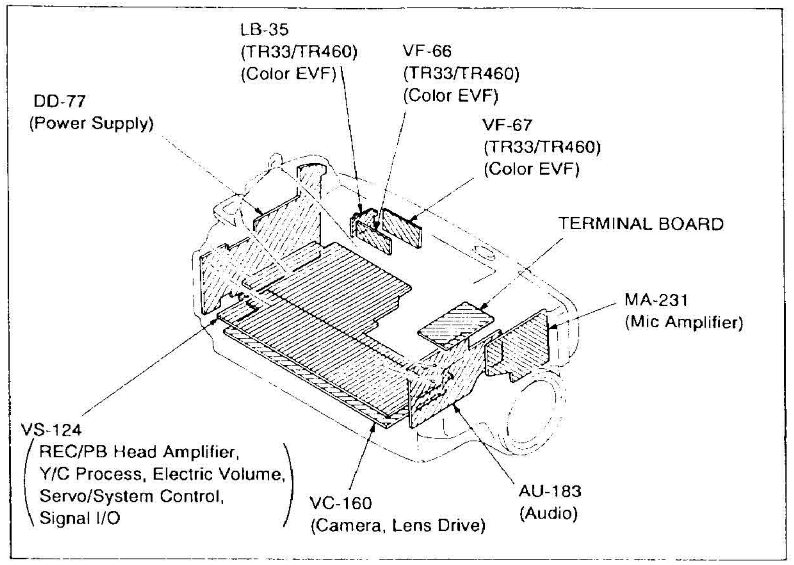
AU-183 (AUDIO) PRINTED WIRING BOARD

— Ref. No. AU-183 BOARD: 3,000 series —

- **For printed wiring boards.**
- AU-183 board is a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.

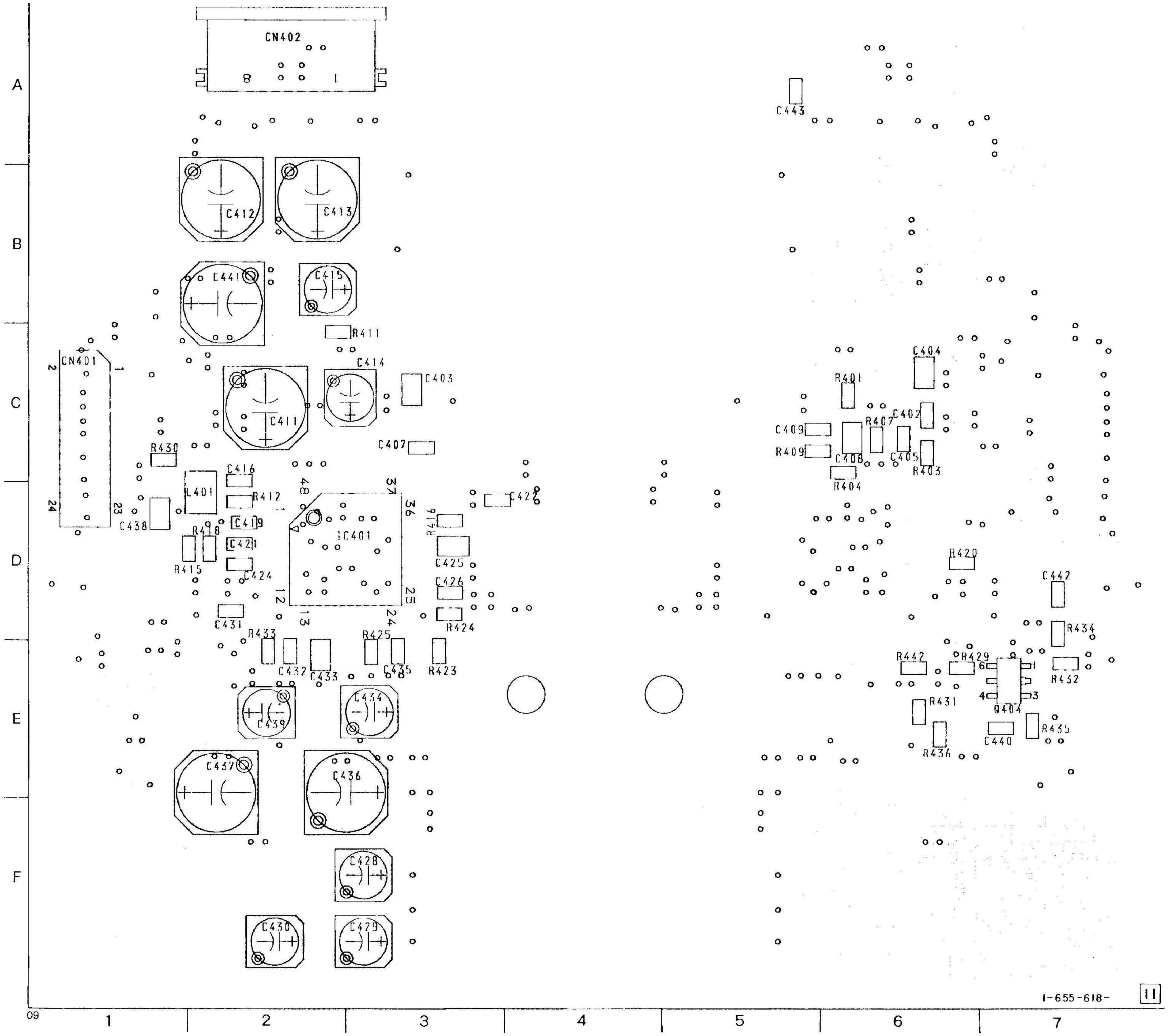
AU-183 BOARD

C402	C-6
C403	C-3
C404	C-6
C405	C-6
C407	C-3
C408	C-6
C409	C-5
C411	C-2
C412	B-2
C413	B-2
C414	C-3
C415	B-2
C416	C-2
C419	D-2
C421	D-2
C422	D-3
C424	D-2
C425	D-3
C426	D-3
C428	F-3
C429	F-3
C430	F-2
C431	D-2
C432	E-2
C433	E-2
C434	E-3
C435	E-3
C436	E-2
C437	E-2
C438	D-1
C439	E-2
C440	E-7
C441	B-2
C442	D-7
C443	A-5
CN401	C-1
CN402	A-2
IC401	D-3
L401	D-2
Q404	E-7
R401	C-6
R403	C-6
R404	C-6
R407	C-6
R408	C-6
R409	C-5
R411	C-2
R412	D-2
R415	D-1
R416	D-3
R418	D-2
R420	D-6
R423	E-3
R424	D-3
R425	E-3
R429	E-6
R430	C-1
R431	E-6
R432	E-7
R433	E-2
R434	D-7
R435	E-7
R436	E-6
R442	E-6


LB-35
(TR33/TR460)
(Color EVF)
VF-66
(TR33/TR460)
(Color EVF)
DD-77
(Power Supply)
VF-67
(TR33/TR460)
(Color EVF)
TERMINAL BOARD
MA-231
(Mic Amplifier)
VS-124
REC/PB Head Amplifier,
Y/C Process, Electric Volume,
Servo/System Control,
Signal I/O
VC-160
(Camera, Lens Drive)
AU-183
(Audio)

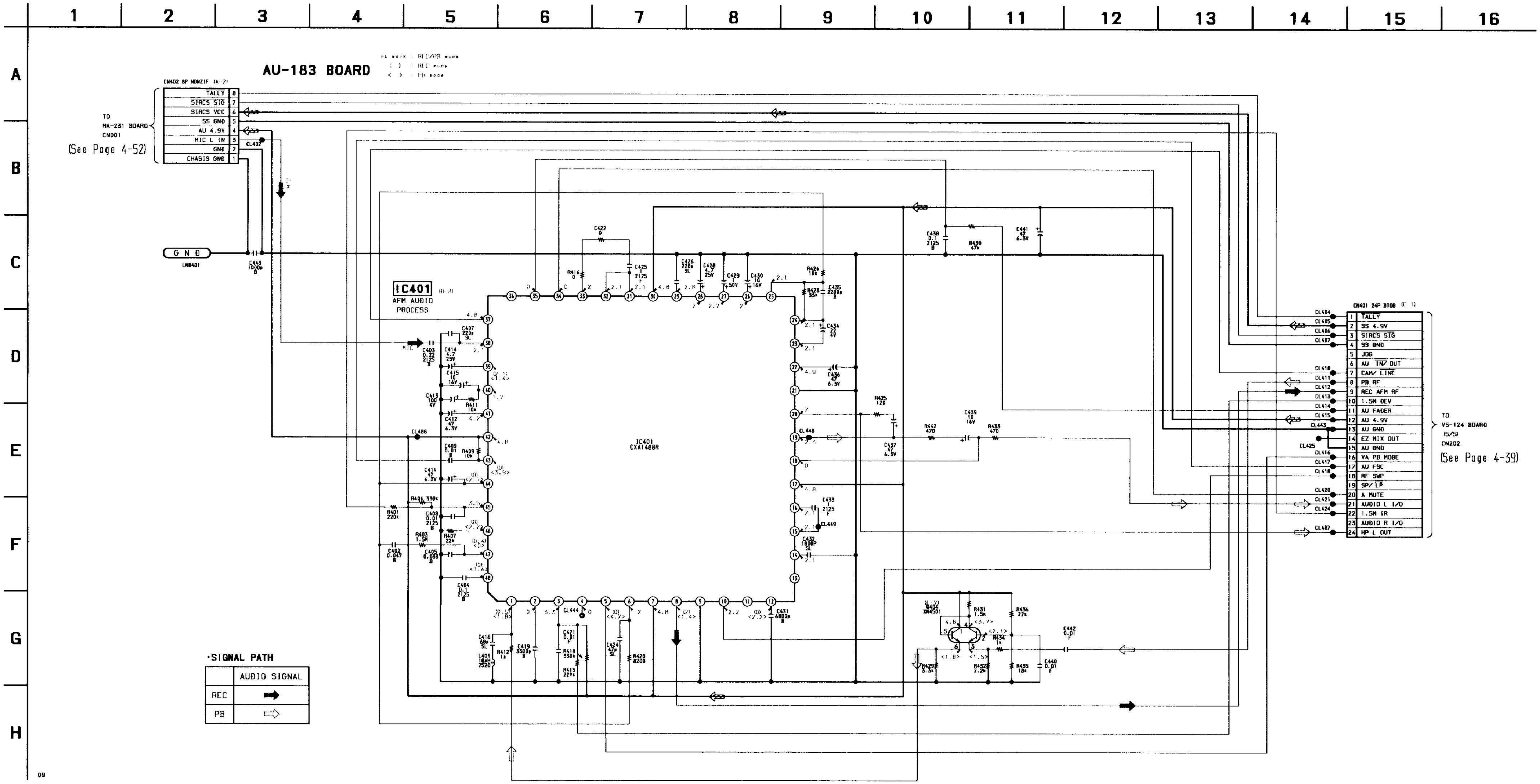
AU-183 BOARD (COMPONENT SIDE)

AU-183 BOARD(CONDUCTOR SIDE)


A
B
C
D
E
F
1
2
3
4
5
6
7
09
CN402
CN401
C412
C413
C441
C415
R411
C414
C403
C411
C407
R430
C416
L401
R412
IC401
C419
C421
R418
R415
C424
C425
C426
R424
C438
C431
R433
R425
C432
C433
C435
R423
R416
C422
C439
C434
C437
C436
C428
C430
C429
C443
C404
R401
C402
R407
C409
R409
C408
C405
R403
R404
R420
C442
R434
R442
R429
R432
R431
Q404
R435
C440
R436
1-655-618-
11

AU-183 (AUDIO) SCHEMATIC DIAGRAM

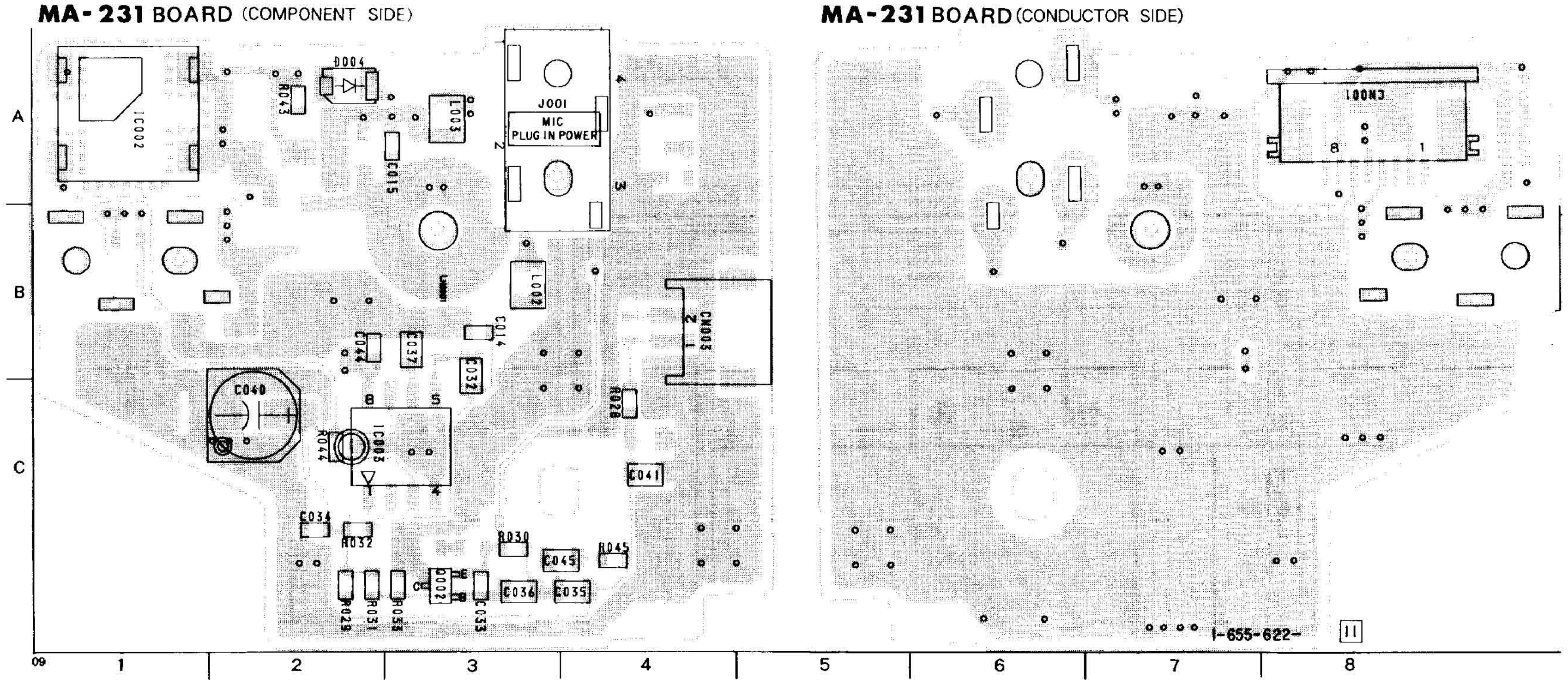
— Ref. No. AU-183 BOARD: 3,000 series —


AU-183 BOARD
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
CN402 8P NONZIF (A-2)
TALLY 8
SIRCS SIG 7
SIRCS VCC 6
SS GND 5
AU 4.9V 4
MIC L IN 3
GND 2
CHASIS GND 1
TO MA-231 BOARD CN001
(See Page 4-52)
CL402
GND
LN0401
C443 1000p B
IC401
AFM AUDIO PROCESS
IC401 CXA1488R
CN401 24P BTOB (C-1)
1 TALLY
2 SS 4.9V
3 SIRCS SIG
4 SS GND
5 JOG
6 AU IN/ OUT
7 CAM/ LINE
8 PB RF
9 REC AFM RF
10 1.5M DEV
11 AU FADER
12 AU 4.9V
13 AU GND
14 EZ MIX OUT
15 AU GND
16 VA PB MODE
17 AU FSC
18 RF SWP
19 SP/ LP
20 A MUTE
21 AUDIO L I/O
22 1.5M IR
23 AUDIO R I/O
24 HP L OUT
CL404
CL405
CL406
CL407
CL410
CL411
CL412
CL413
CL414
CL415
CL443
CL425
CL416
CL417
CL418
CL420
CL421
CL424
CL487
TO VS-124 BOARD (5/5) CN202
(See Page 4-39)
Q404 XN4501
•SIGNAL PATH
AUDIO SIGNAL
REC
PB
09

MA-231 (MIC AMPLIFIER) PRINTED WIRING BOARD

— Ref. No. MA-231 BOARD: 3,000 series —

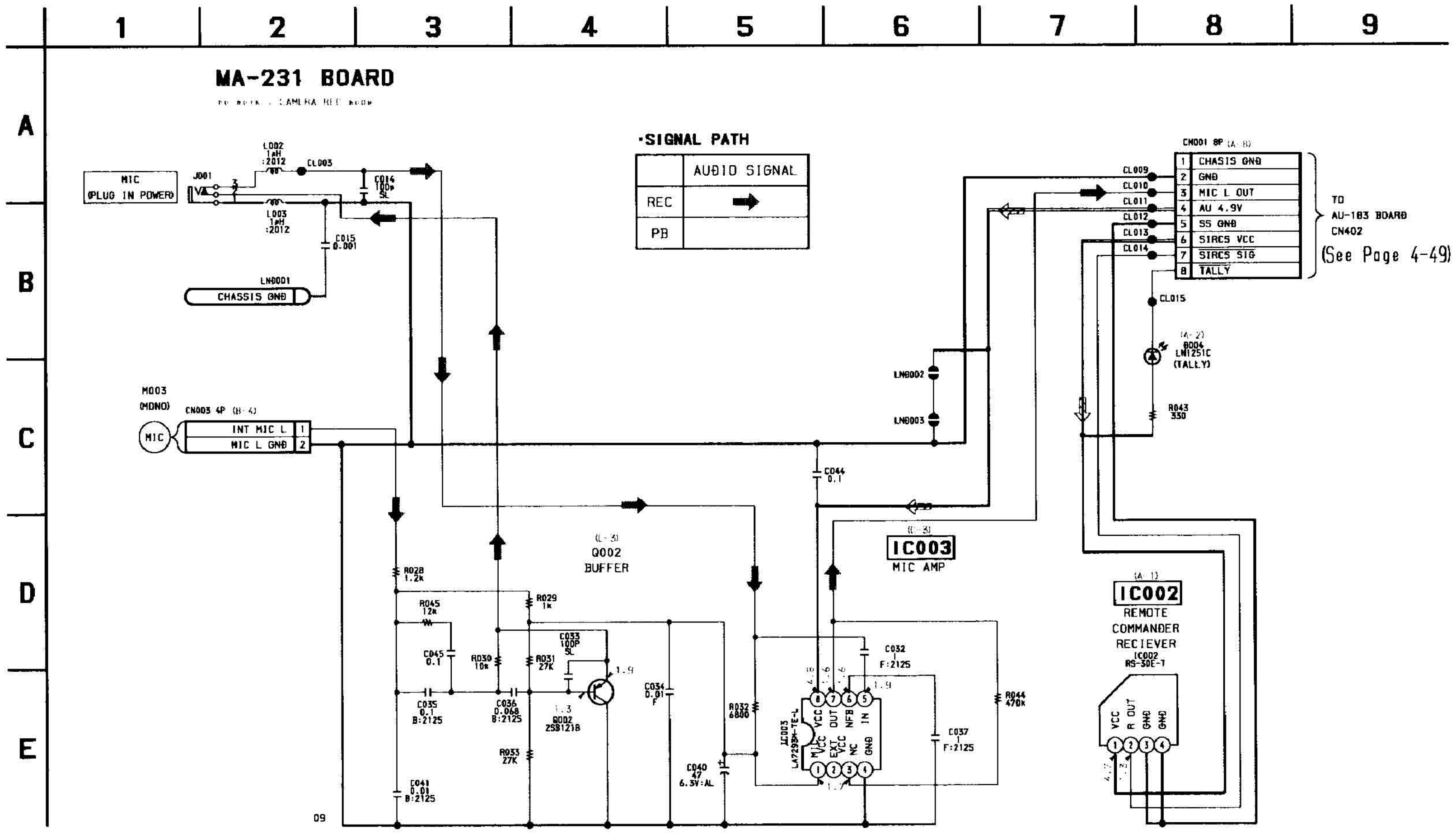
- **For printed wiring boards.**
- MA-231 board is a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.

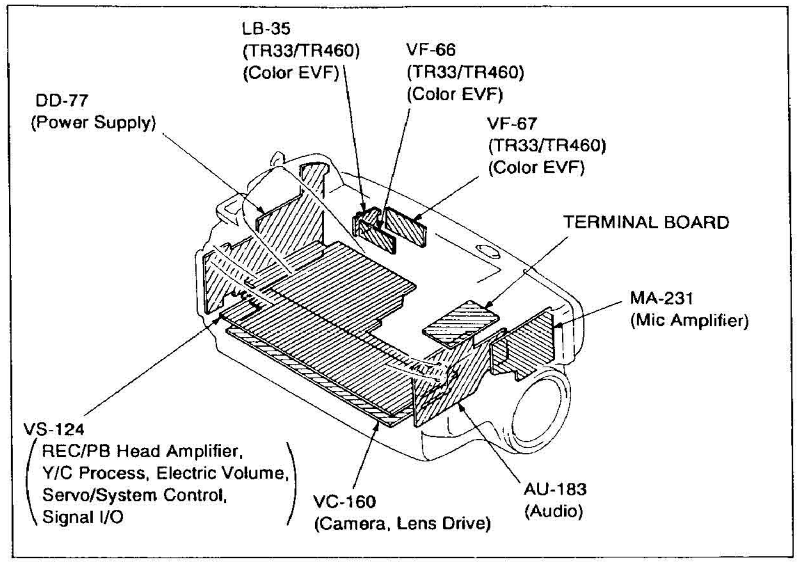

MA-231 BOARD (COMPONENT SIDE)
MA-231 BOARD (CONDUCTOR SIDE)
A
B
C
1
2
3
4
5
6
7
8
09
IC002
D004
R043
L003
J001
MIC PLUG IN POWER
C015
L001
L002
C014
CN003
C044
C037
C032
R028
C040
R044
IC003
Q002
C041
C034
R032
R030
R045
C045
C036
C035
C033
R029
R031
R033
CN001
1-655-622-
11

MA-231	BOARD
C014	B-3
C015	A-3
C032	B-3
C033	C-3
C034	C-2
C035	C-4
C036	C-3
C037	B-3
C040	C-2
C041	C-4
C044	B-2
C045	C-4
CN001	A-8
CN003	B-4
D004	A-2
IC002	A-1
IC003	C-3
J001	A-4
L001	A-4
L002	B-3
L003	A-3
Q002	C-3
R028	C-4
R029	C-2
R030	C-3
R031	C-2
R032	C-2
R033	C-3
R043	A-2
R044	C-2
R045	C-4

MA-231 (MIC AMPLIFIER) SCHEMATIC DIAGRAM

— Ref. No. MA-231 BOARD: 3,000 series —

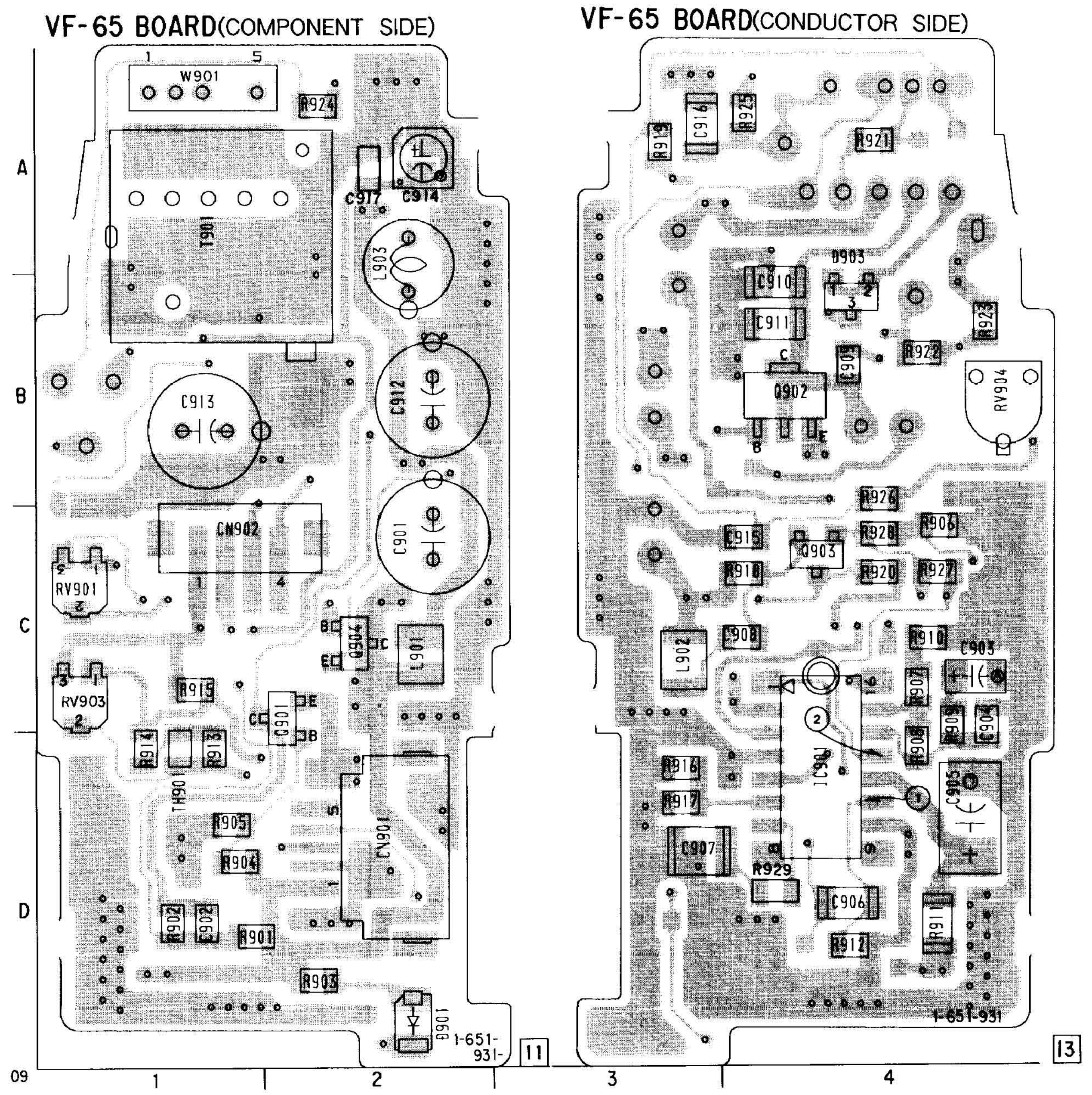

1
2
3
4
5
6
7
8
9
A
B
C
D
E
MA-231 BOARD
•SIGNAL PATH
AUDIO SIGNAL
REC
PB
MIC (PLUG IN POWER)
J001
L002 1μH :2012
CL003
C014 100p SL
L003 1μH :2012
C015 0.001
LN0001
CHASSIS GND
M003 (MONO)
CN003 4P (B-4)
MIC
INT MIC L
MIC L GND
CN001 8P (A-8)
CL009
CL010
CL011
CL012
CL013
CL014
CHASIS GND
GND
MIC L OUT
AU 4.9V
SS GND
SIRCS VCC
SIRCS SIG
TALLY
TO AU-183 BOARD CN402
(See Page 4-49)
CL015
D004 LN1251C (TALLY)
R043 330
LN0002
LN0003
C044 0.1
Q002 BUFFER
IC003 MIC AMP
IC002 REMOTE COMMANDER RECIEVER
IC002 RS-30E-T
R028 1.2k
R045 12k
R029 1k
C045 0.1
R030 10k
R031 27K
C033 100P SL
C035 0.1 B:2125
C036 0.068 B:2125
Q002 2SB1218
C034 0.01 F
R032 6800
IC003 LA7293M-TE-L
VCC
OUT
NFB
IN
MIC VCC
EXT VCC
NC
GND
C032 1 F:2125
C037 1 F:2125
R044 470k
R033 27K
C040 47 6.3V:AL
C041 0.01 B:2125
R OUT
09


LB-35 (TR33/TR460) (Color EVF)
VF-66 (TR33/TR460) (Color EVF)
DD-77 (Power Supply)
VF-67 (TR33/TR460) (Color EVF)
TERMINAL BOARD
MA-231 (Mic Amplifier)
VS-124 (REC/PB Head Amplifier, Y/C Process, Electric Volume, Servo/System Control, Signal I/O)
VC-160 (Camera, Lens Drive)
AU-183 (Audio)

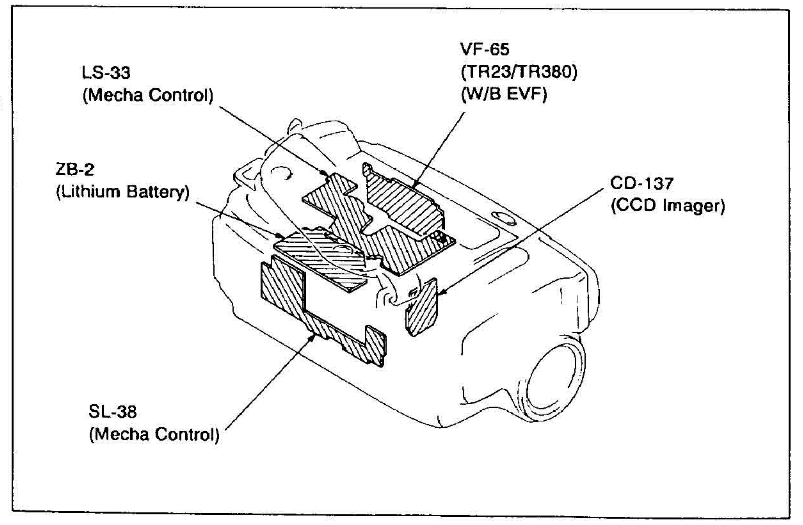
VF-65 (W/B EVF) PRINTED WIRING BOARD (CCD-TR23/TR380)

— Ref. No. VF-65 BOARD: 4,000 series —

VF-65 BOARD	
C901	C-2
C902	D-1
C903	C-4
C904	C-4
C905	D-4
C906	D-4
C907	D-3
C908	C-4
C909	B-4
C910	B-4
C911	B-4
C912	B-2
C913	B-1
C914	A-2
C915	C-4
C916	A-3
C917	A-2
CN901	D-2
CN902	C-1
D901	D-2
D903	B-4
IC901	D-4
L901	C-2
L902	C-3
L903	A-2
Q901	C-2
Q902	B-4
Q903	C-4
Q904	C-2
R901	D-1
R902	D-1
R903	D-2
R904	D-1
R905	D-1
R906	C-4
R907	C-4
R908	D-4
R909	C-4
R910	C-4
R911	D-4
R912	D-4
R913	D-1
R914	D-1
R915	C-1
R916	D-3
R917	D-3
R918	C-4
R919	A-3
R920	C-4
R921	A-4
R922	B-4
R923	B-4
R924	A-2
R925	A-4
R926	B-4
R927	C-4
R928	C-4
R929	D-4
RV903	C-1
RV904	B-4
T901	A-1
TH901	D-1
W901	A-1

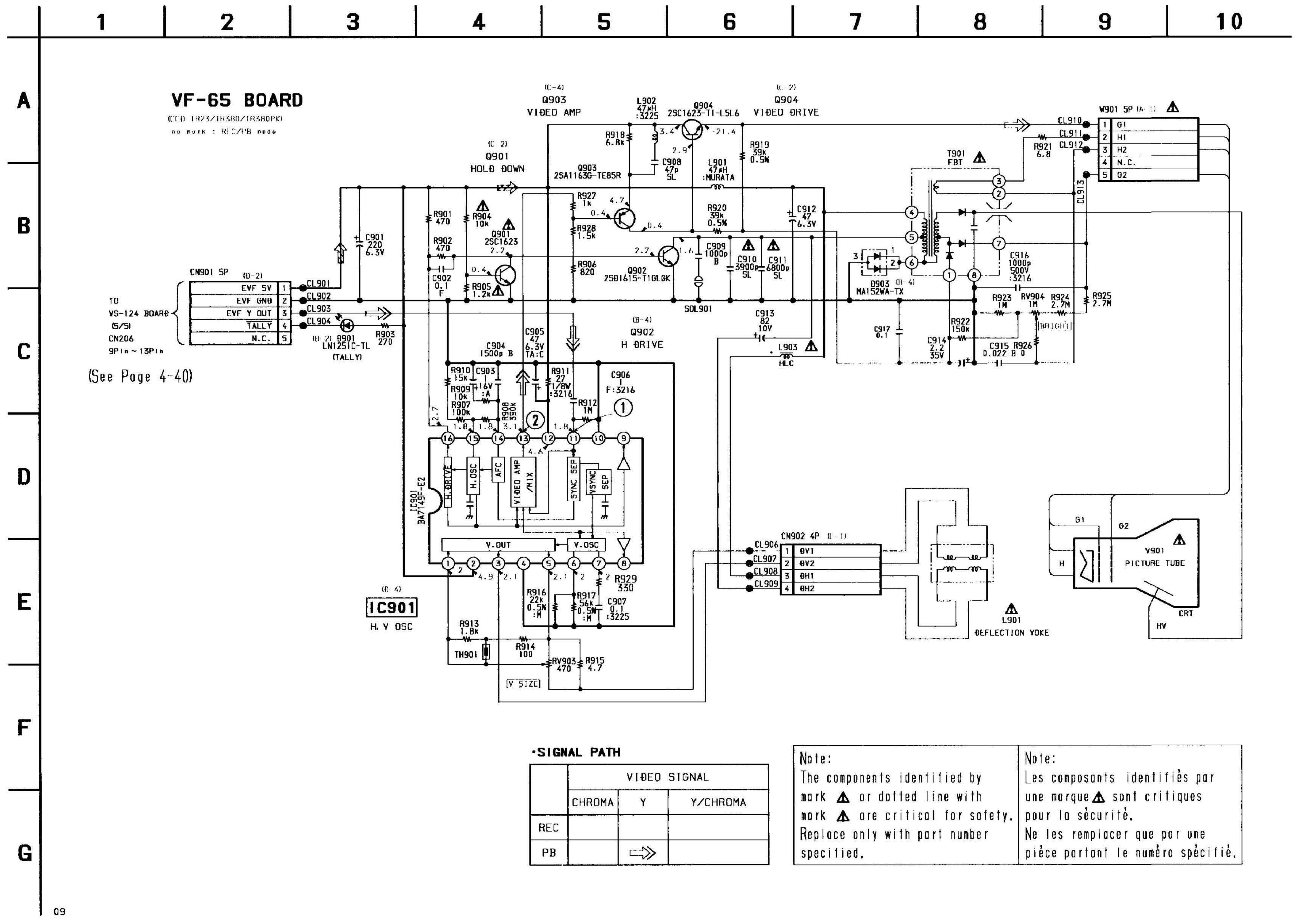

VF-65 BOARD(COMPONENT SIDE)
VF-65 BOARD(CONDUCTOR SIDE)
A
B
C
D
1
2
3
4
09
11
13
W901
T901
C913
C912
C914
C917
CN902
RV901
RV903
RV904
1-651-931-
IC901

- **For printed wiring boards.**
- VF-65 board is a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.


LS-33
(Mecha Control)
VF-65
(TR23/TR380)
(W/B EVF)
ZB-2
(Lithium Battery)
CD-137
(CCD Imager)
SL-38
(Mecha Control)

VF-65 (W/B EVF) SCHEMATIC DIAGRAM (CCD-TR23/TR380)

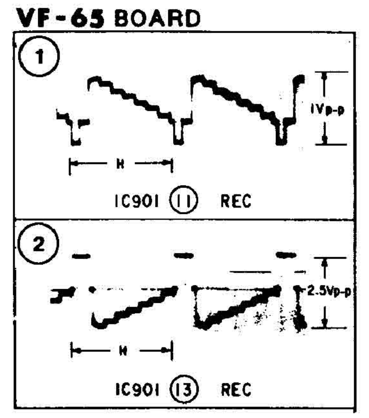
— Ref. No. VF-65 BOARD: 4,000 series —


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
VF-65 BOARD
(CCD-TR23/TR380/TR380PK)
no mark : REC/PB mode
Q903
VIDEO AMP
Q904
VIDEO DRIVE
Q901
HOLD DOWN
Q902
H DRIVE
TO VS-124 BOARD (5/5) CN206 9Pin ~ 13Pin
CN901 5P
EVF 5V
EVF GND
EVF Y OUT
TALLY
N.C.
D901 LN1251C-TL (TALLY)
(See Page 4-40)
T901 FBT
W901 5P
G1
H1
H2
N.C.
G2
D903 MA152WA-TX
BRIGHT
IC901 BA7149F-E2
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V.OUT
V.OSC
IC901
H. V OSC
V SIZE
TH901
CN902 4P
DV1
DV2
DH1
DH2
L901
DEFLECTION YOKE
V901
PICTURE TUBE
CRT
HV
09

·SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB		⇨	

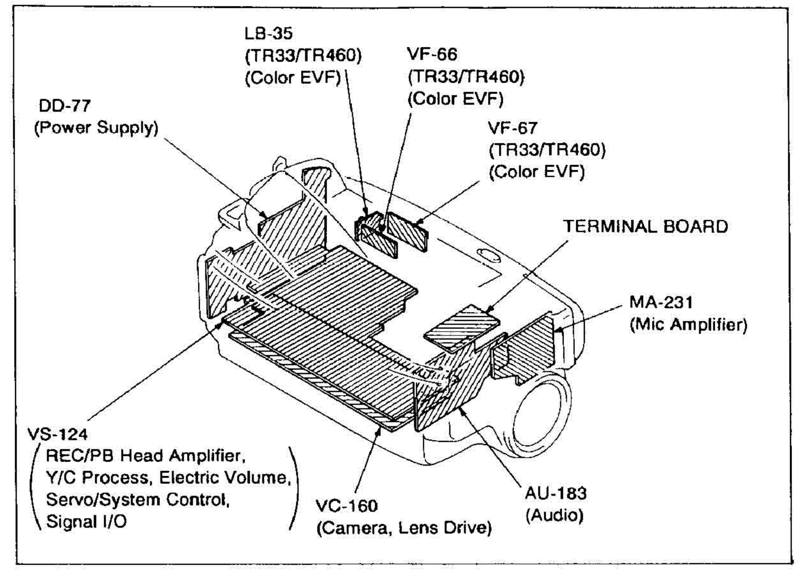
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiès par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



LB-35 (COLOR EVF), VF-66 (COLOR EVF), VF-67 (COLOR EVF) PRINTED WIRING BOARDS (CCD-TR33/TR460)

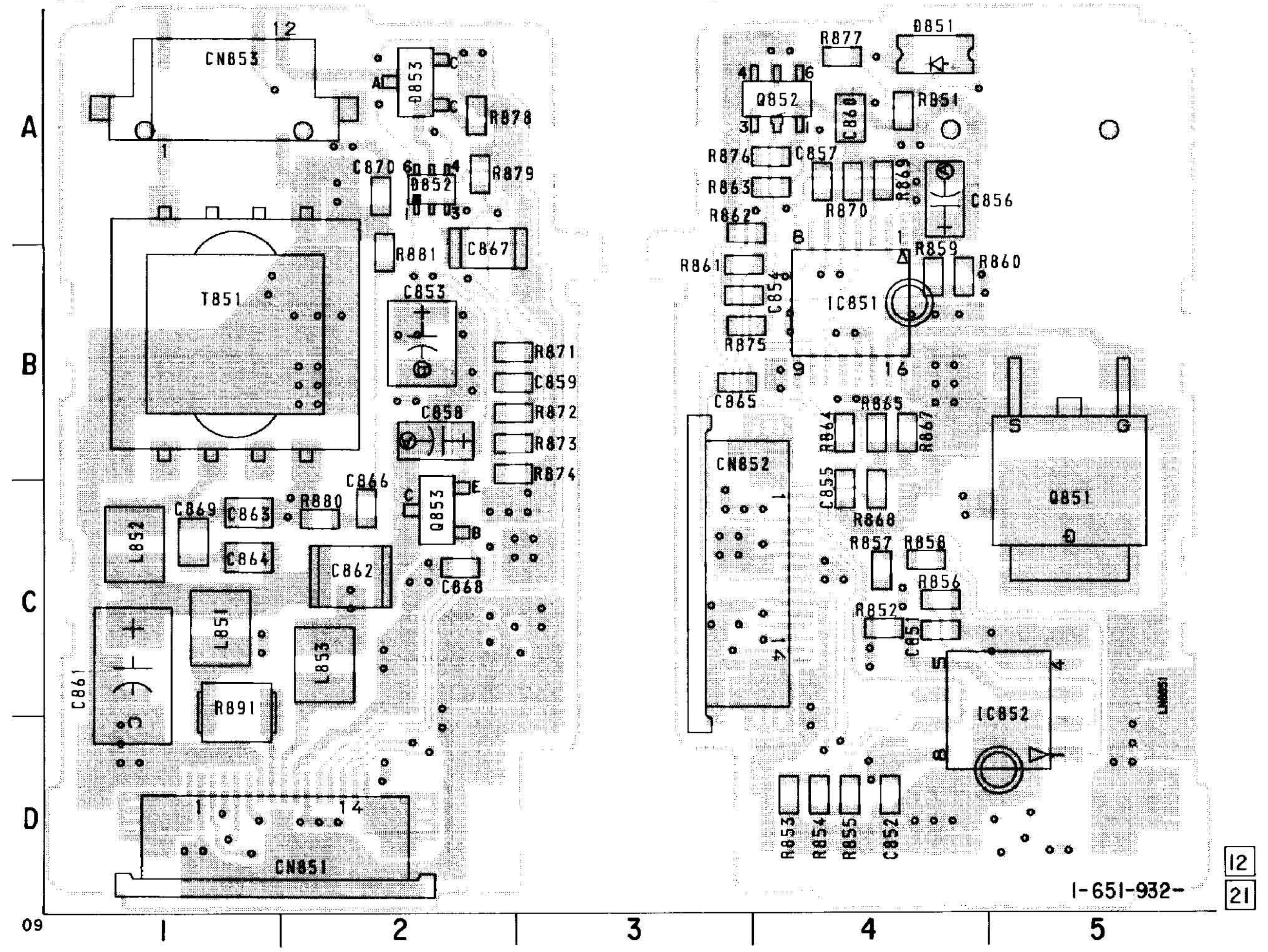
— Ref. No. LB-35, VF-66 and VF-67 BOARD: 4,000 series —

- **For printed wiring boards.**
- VF-66, VF-67, LB-35 boards are a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.

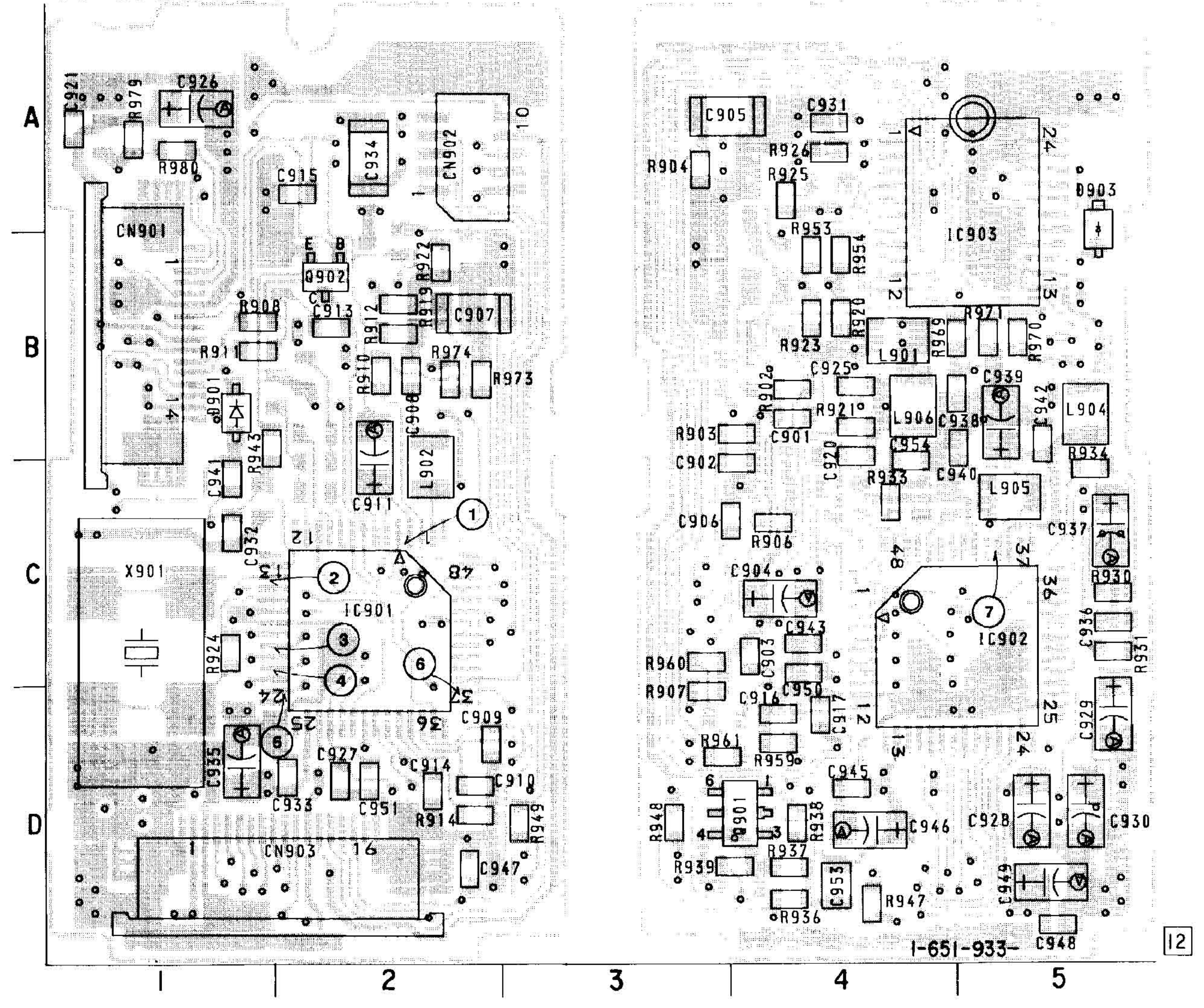

LB-35
(TR33/TR460)
(Color EVF)
VF-66
(TR33/TR460)
(Color EVF)
DD-77
(Power Supply)
VF-67
(TR33/TR460)
(Color EVF)
TERMINAL BOARD
MA-231
(Mic Amplifier)
VS-124
REC/PB Head Amplifier, Y/C Process, Electric Volume, Servo/System Control, Signal I/O
VC-160
(Camera, Lens Drive)
AU-183
(Audio)

•NOTE
•Be sure to check the part number of the board applied to the set when performing service

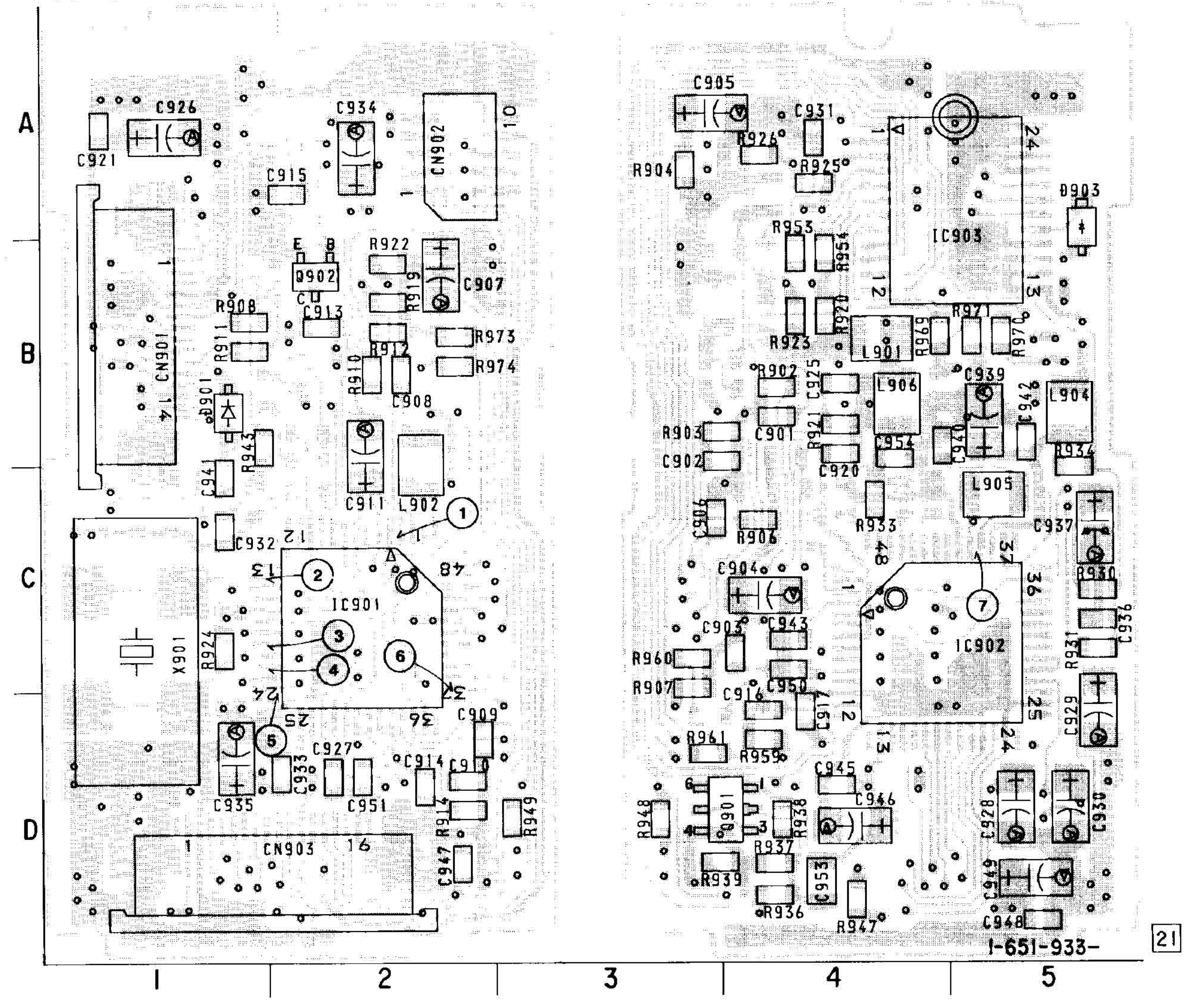
VF-66BOARD(COMPONENT SIDE) **VF-66BOARD**(CONDUCTOR SIDE)


A
B
C
D
1
2
3
4
5
09
CN853
T851
CN852
IC851
Q851
IC852
CN851
1-651-932-
12
21

VF-67BOARD (COMPONENT SIDE) **VF-67BOARD** (CONDUCTOR SIDE)

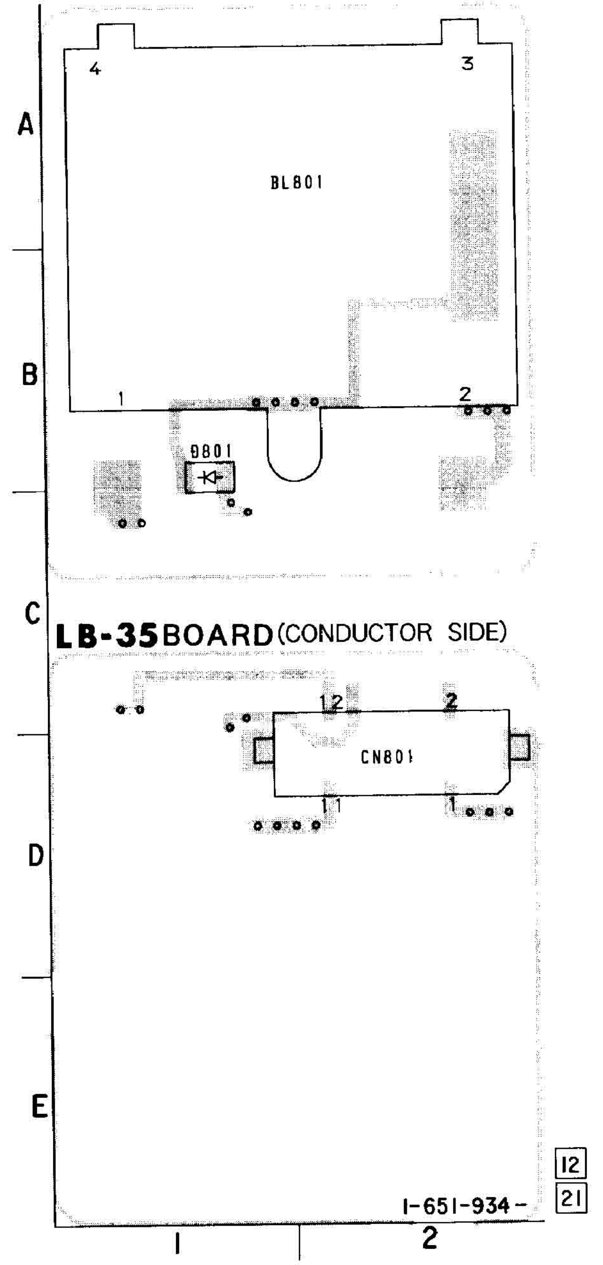

A
B
C
D
1
2
3
4
5
CN901
IC901
IC902
IC903
X901
CN903
1-651-933-
12

VF-67BOARD (COMPONENT SIDE) **VF-67BOARD** (CONDUCTOR SIDE)


A
B
C
D
1
2
3
4
5
CN901
IC901
IC902
IC903
X901
CN903
1-651-933-
21

LB-35BOARD(COMPONENT SIDE)

LB-35BOARD(CONDUCTOR SIDE)


A
B
C
D
E
1
2
BL801
D801
CN801
1-651-934-
12
21

LB-35 BOARD

BL801	A-1
CN801	D-2
D801	B-1

VF-66 BOARD

C851	C-4	CN851	D-1	R853	D-4	R875	B-3
C852	D-4	CN852	C-3	R854	D-4	R876	A-4
C853	B-2	CN853	A-1	R855	D-4	R877	A-4
C854	B-3			R856	C-4	R878	A-2
C855	C-4	D851	A-4	R857	C-4	R879	A-2
C856	A-4	D852	A-2	R858	C-4	R880	C-2
C857	A-4	D853	A-2	R859	B-4	R881	B-2
C858	B-2			R860	B-4	R891	C-1
C859	B-2	IC851	B-4	R861	B-3		
C860	A-4	IC852	C-5	R862	A-3	T851	B-1
C861	C-1			R863	A-4		
C862	C-2	L851	C-1	R864	B-4		
C863	C-1	L852	C-1	R865	B-4		
C864	C-1	L853	C-2	R867	B-4		
C865	B-3			R868	C-4		
C866	C-2	Q851	C-5	R869	A-4		
C867	B-2	Q852	A-4	R870	A-4		
C868	C-2	Q853	C-2	R871	B-2		
C869	C-1			R872	B-2		
C870	A-2	R851	A-4	R873	B-2		
		R852	C-4	R874	B-2		

VF-67 BOARD (-12)

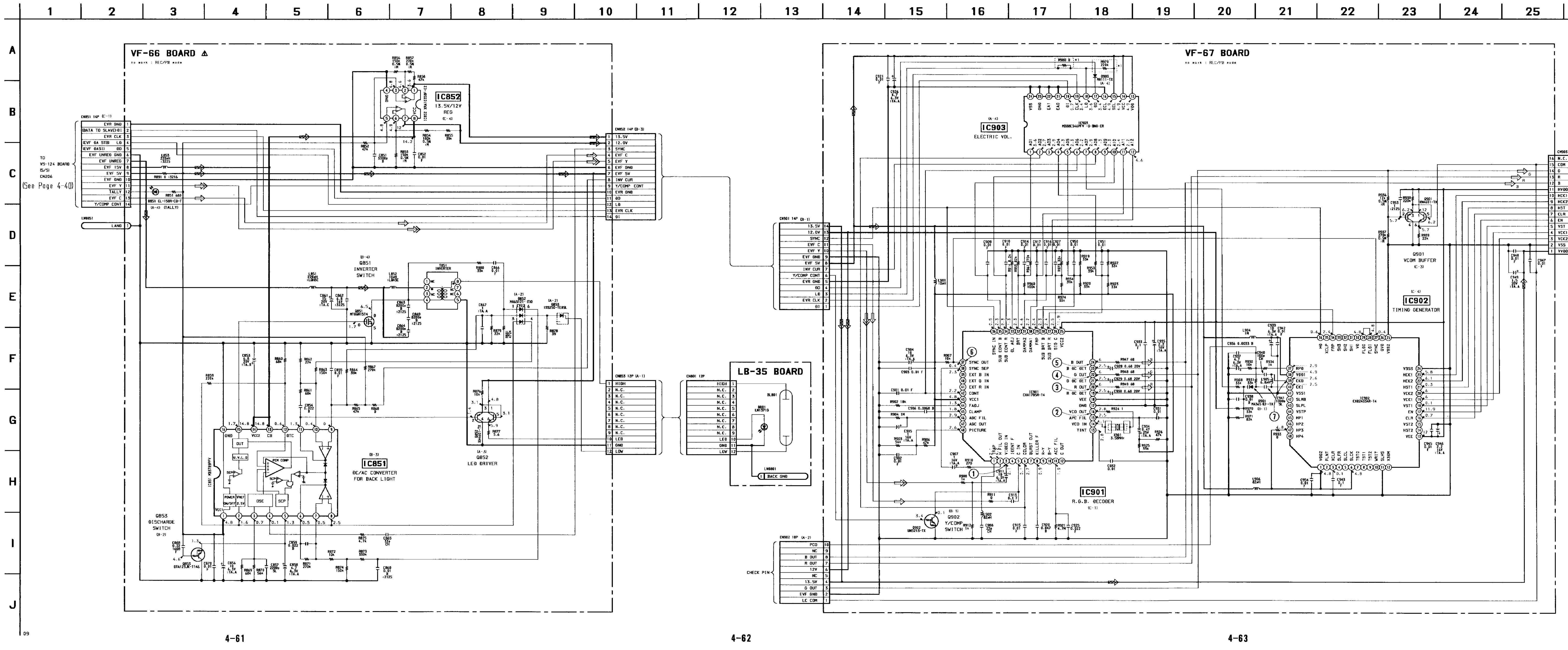
C901	B-4	C928	D-5	C950	C-4	Q901	D-4	R930	C-5	R969	B-4
C902	C-3	C929	D-5	C951	D-2	Q902	B-2	R931	C-5	R970	B-5
C903	C-4	C930	D-5	C953	D-4			R933	C-4	R971	B-5
C904	C-4	C931	A-4	C954	C-4	R902	B-4	R934	C-5	R973	B-2
C905	A-3	C932	C-1			R903	B-3	R936	D-4	R974	B-2
C906	C-3	C933	D-2	CN901	B-1	R904	A-3	R937	D-4	R979	A-1
C907	B-2	C934	A-2	CN902	A-2	R906	C-4	R938	D-4		
C908	B-2	C935	D-1	CN903	D-2	R907	D-3	R939	D-3		
C909	D-2	C936	C-5			R908	B-1	R947	D-4	R980	A-1
C910	D-2	C937	C-5	D901	B-1	R910	B-2	R948	D-3		
C911	B-2	C938	B-4	D903	A-5	R911	B-1	R949	D-3	X901	C-1
C913	B-2	C939	B-5			R912	B-2	R950	B-4		
C914	D-2	C940	B-4	IC901	C-2	R914	D-2	R951	B-4		
C915	A-2	C941	C-1	IC902	C-4	R919	B-2	R952	B-4		
C916	D-4	C942	B-5	IC903	A-5	R920	B-4	R953	B-4		
C917	D-4	C943	C-4			R921	B-4	R954	B-4		
C920	B-4	C945	D-4	L901	B-4	R922	B-2	R955	B-2		
C921	A-1	C946	D-4	L902	C-2	R923	B-4	R956	A-4		
C925	B-4	C947	D-2	L904	B-5	R924	C-1	R959	D-4		
C926	A-1	C948	D-5	L905	C-5	R925	A-4	R960	C-3		
C927	D-2	C949	D-5	L906	B-4	R926	A-4	R961	D-3		

VF-67 BOARD (-21)

C901	B-4	C928	D-5	C951	D-2	Q901	D-4	R930	C-5	R974	B-2
C902	C-3	C929	D-5	C953	D-4	Q902	B-2	R931	C-5		
C903	C-4	C930	D-5	C954	C-4			R933	C-4	X901	C-1
C904	C-4	C931	A-4			R902	B-4	R934	C-5		
C905	A-3	C932	C-1	CN901	B-1	R903	B-3	R936	D-4		
C906	C-3	C933	D-2	CN902	A-2	R904	A-3	R937	D-4		
C907	B-2	C934	A-2	CN903	D-2	R906	C-4	R938	D-4		
C908	B-2	C935	D-1			R907	D-3	R939	D-3		
C909	D-2	C936	C-5	D901	B-1	R908	B-1	R943	B-1		
C910	D-2	C937	C-5	D903	A-5	R910	B-2	R947	D-4		
C911	B-2	C939	B-5			R911	B-1	R948	D-3		
C913	B-2	C940	B-4	IC901	C-2	R912	B-2	R949	D-3		
C914	D-2	C941	C-1	IC902	C-4	R914	D-2	R953	B-4		
C915	A-2	C942	B-5	IC903	A-5	R919	B-2	R954	B-4		
C916	D-4	C943	C-4			R920	B-4	R959	D-4		
C917	D-4	C945	D-4	L901	B-4	R921	B-4	R960	C-3		
C920	B-4	C946	D-4	L902	C-2	R922	B-2	R961	D-3		
C921	A-1	C947	D-2	L904	B-5	R923	B-4	R969	B-4		
C925	B-4	C948	D-5	L905	C-5	R924	C-1	R970	B-5		
C926	A-1	C949	D-5	L906	B-4	R925	A-4	R971	B-5		
C927	D-2	C950	C-4			R926	A-4	R973	B-2		

LB-35 (COLOR EVF), VF-66 (COLOR EVF), VF-67 (COLOR EVF) SCHEMATIC DIAGRAMS (CCD-TR33/TR460)

— Ref. No. LB-35, VF-66 and VF-67 BOARD: 4,000 series —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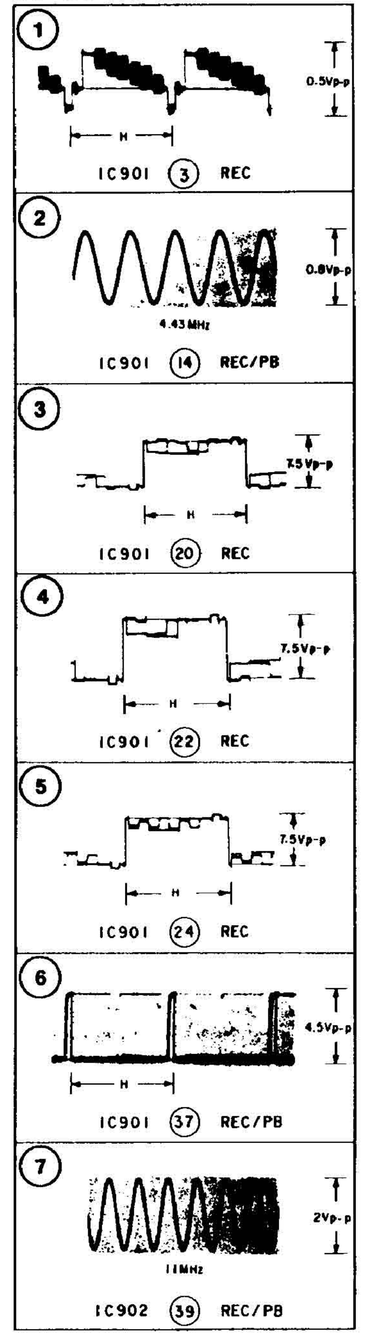
J
VF-66 BOARD ⚠
TO VS-124 BOARD (5/5) CN206
(See Page 4-40)
CN851 14P
EVR GND
(DATA TO SLAVE) DI
EVR CLK
(EVF DA STB) LD
(EVF DASI) DO
EVF UNREG GND
EVF UNREG
EVF 15V
EVF 5V
EVF GND
EVF Y
TALLY
EVF C
Y/COMP CONT
LAND
D851 CL-150R-CD-T (TALLY)
IC852 13.5V/12V REG
Q851 INVERTER SWITCH
T851 INVERTER
IC851 DC/AC CONVERTER FOR BACK LIGHT
Q852 LED DRIVER
Q853 DISCHARGE SWITCH
LB-35 BOARD
BACK GND
VF-67 BOARD
IC903 ELECTRIC VOL.
IC901 R.G.B. DECODER
IC902 TIMING GENERATOR
Q901 VCOM BUFFER
Q902 Y/COMP SWITCH
CHECK PIN
CN903 16P
TO COLOR LCD BLOCK

•COLOR LCD BLOCK is replaced as a block, so that there PRINTED WIRING BOARD SCHEMATIC DIAGRAM is omitted.

VF-67 BOARD



NOTE

- Be sure to check the part number of the board applied to the set when performing service.
- *1 Last digit - 12

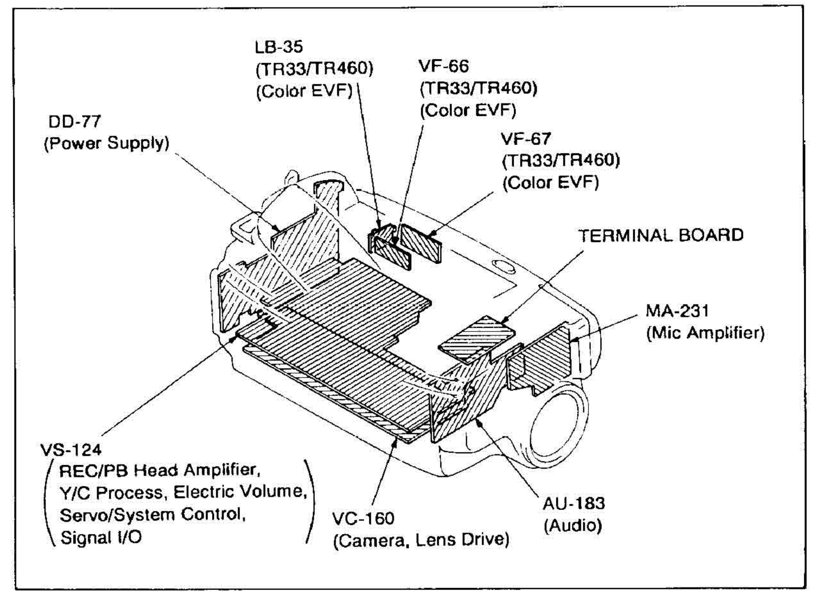
·SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB	⇨	⇨⟫	

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

DD-77 BOARD

C901	A-11
C902	A-11
C903	A-11
C904	A-11
C906	B-2
C907	C-12
C908	C-3
C909	C-3
C910	B-11
C911	C-12
C912	F-6
C913	D-3
C914	D-3
C915	C-10
C917	C-10
C918	D-11
C920	C-9
C921	D-9
C923	D-9
C924	E-9
C925	B-5
C926	B-4
C927	D-9
C928	E-10
C929	B-9
C930	B-5
C931	D-6
C932	E-6
C934	C-6
C936	C-6
C938	C-6
C939	B-4
C940	B-4
C941	B-4
C942	A-3
C943	B-3
C944	B-3
C945	F-5
C946	B-2
C950	B-6
CN901	D-7
D901	B-10
D909	D-9
D910	B-12
F450	F-5
F451	F-5
F452	F-6
IC901	B-3
J901	H-10
J902	A-13
J903	B-13
L901	D-3
L902	C-3
L903	E-3
L904	C-5
L905	D-5
L906	D-4
L907	D-4
L908	D-5
L909	E-9
L910	D-9
L912	D-8
L914	B-10
L915	B-9
L916	D-9
L917	C-9
L918	B-2
L919	B-12
Q900	B-9
Q901	B-9
Q902	C-11
Q903	C-10
Q904	D-10
Q905	D-10
Q906	D-11
Q907	E-11
Q908	B-10
Q909	C-9
Q910	B-9
Q914	C-8
Q915	B-5
R901	B-11
R902	B-2
R903	B-4
R904	B-2
R905	B-2
R906	B-4
R907	B-3
R908	B-4
R909	C-12
R910	C-3
R911	C-3
R912	B-11
R913	B-12
R916	D-6
R917	E-8
R918	B-9
R919	B-4
R920	B-4
R922	C-9
R924	A-12
R925	C-12
R927	B-11
R928	B-12
R932	B-2
R936	B-2
R937	B-8
R938	B-5
R939	A-4
R940	A-4
R941	B-11
R943	C-9
R944	C-9
R945	B-12
R946	B-9
R947	B-10
R948	B-10
R949	B-10
T901	C-4

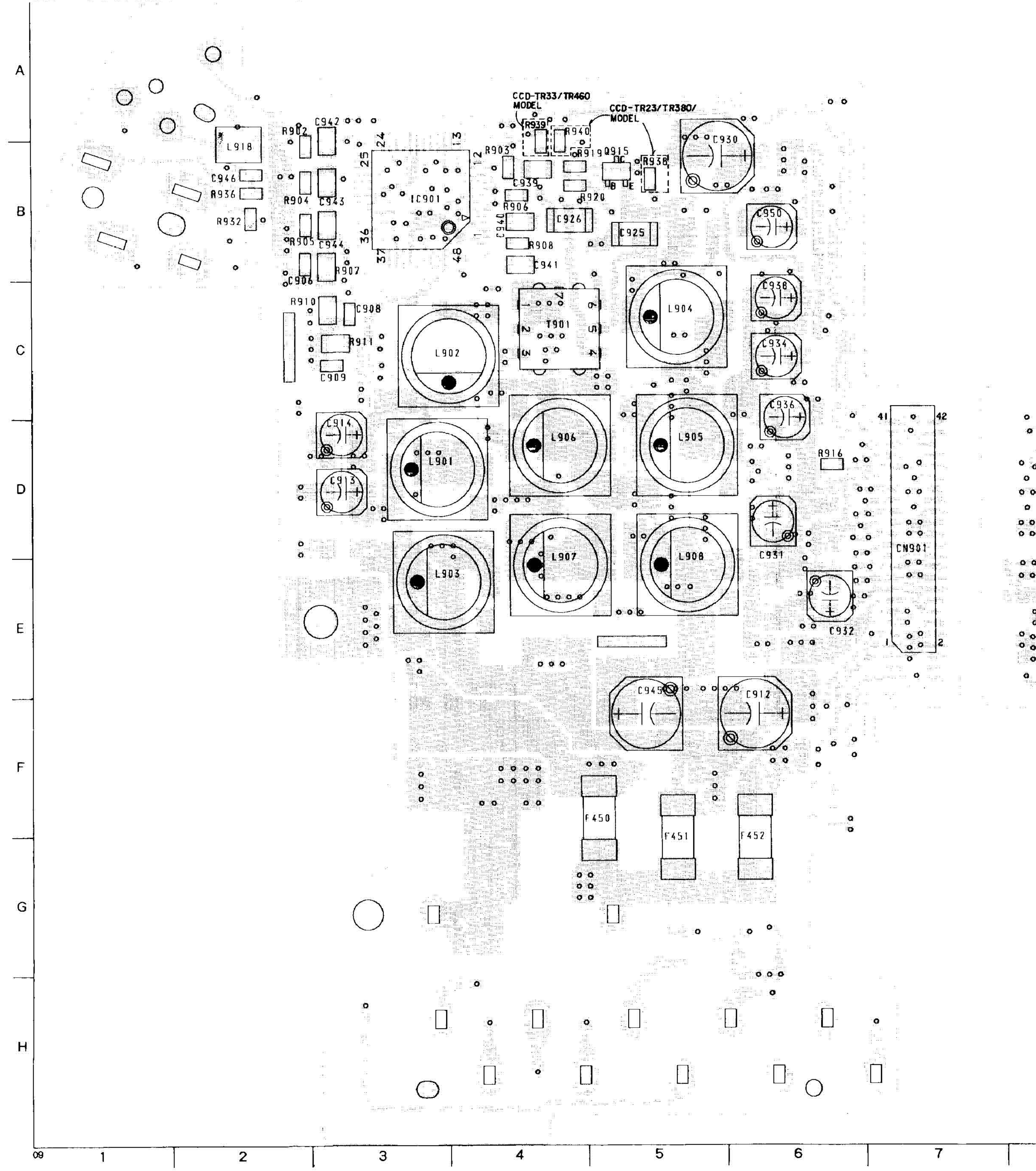

LB-35
(TR33/TR460)
(Color EVF)
VF-66
(TR33/TR460)
(Color EVF)
DD-77
(Power Supply)
VF-67
(TR33/TR460)
(Color EVF)
TERMINAL BOARD
MA-231
(Mic Amplifier)
VS-124
(REC/PB Head Amplifier, Y/C Process, Electric Volume, Servo/System Control, Signal I/O)
VC-160
(Camera, Lens Drive)
AU-183
(Audio)

DD-77 (POWER SUPPLY) PRINTED WIRING BOARD

— Ref. No. DD-77 BOARD: 5,000 series —

- **For printed wiring boards.**
- DD-77 board is a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.

DD-77BOARD (COMPONENT SIDE)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CCD-TR33/TR460 MODEL
CCD-TR23/TR380/ MODEL
IC901
L918
L902
L901
L903
L904
L905
L906
L907
L908
T901
C925
C926
C950
C945
C912
C931
C932
F450
F451
F452
CN901
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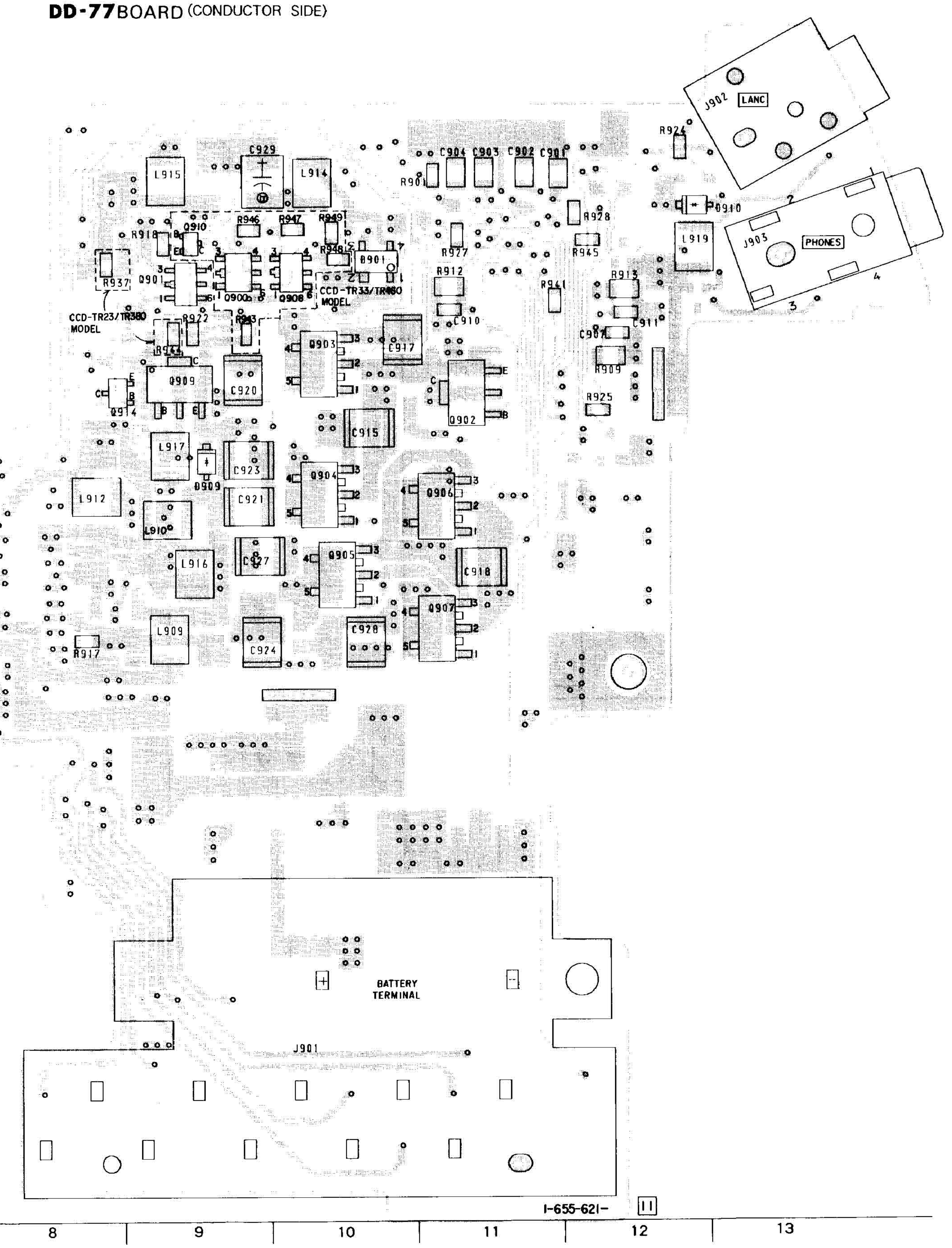
2

DD-77BOARD (CONDUCTOR SIDE)


J902
LANC
J903
PHONES
CCD-TR23/TR380 MODEL
CCD-TR33/TR460 MODEL
L915
L914
L919
L917
L912
L916
L909
C929
C920
C915
C923
C921
C924
C928
C918
Q901
Q902
Q903
Q904
Q905
Q907
Q909
BATTERY TERMINAL
J901
1-655-621-
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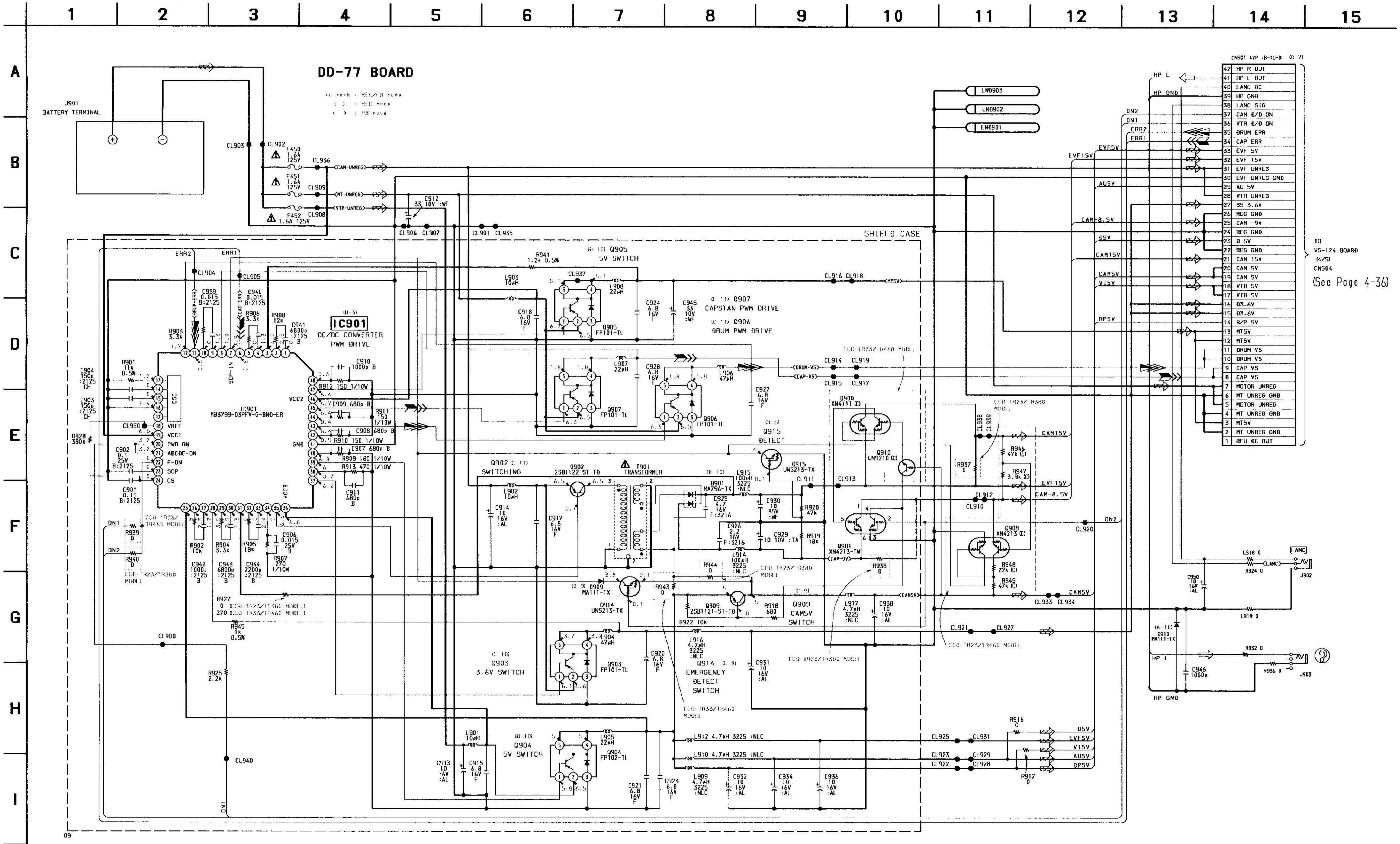
13

DD-77 (POWER SUPPLY) SCHEMATIC DIAGRAM

— Ref. No. DD-77 BOARD: 5,000 series —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H
I
J
DD-77 BOARD
J901
BATTERY TERMINAL
F450 1.6A 125V
F451 1.6A 125V
F452 1.6A 125V
CL902
CL903
CL936
CL909
CL908
CAM-UNREG
MT-UNREG
VTR-UNREG
C912 33 10V :WF
CL906 CL907
CL901 CL935
SHIELD CASE
IC901
DC/DC CONVERTER
PWM DRIVE
IC901
MB3799-03PFV-G-BND-ER
ERR2
ERR1
CL904
CL905
VREF
VCC1
PWR ON
ABCDE-ON
F-ON
SCP
CS
VCC2
VCC3
GND
OSC
Q905
5V SWITCH
Q905 FP101-TL
Q907
CAPSTAN PWM DRIVE
Q906
DRUM PWM DRIVE
Q907 FP101-TL
Q906 FP101-TL
Q902
SWITCHING
Q902 2SB1122-ST-TD
T901
TRANSFORMER
D901 MA796-TX
Q915
DETECT
Q915 UN5213-TX
Q900 XN4111
Q910 UN9210
Q901 XN4213-TW
Q908 XN4213
Q909 MA111-TX
Q914 UN5213-TX
Q909 2SB1121-ST-TD
Q909
CAM5V
SWITCH
Q903
3.6V SWITCH
Q903 FP101-TL
Q914
EMERGENCY
DETECT
SWITCH
Q904
5V SWITCH
Q904 FP102-TL
L901 10µH
L902 10µH
L903 10µH
L904 47µH
L905 22µH
L906 47µH
L907 22µH
L908 22µH
L909 4.7µH 3225 :NLC
L910 4.7µH 3225 :NLC
L912 4.7µH 3225 :NLC
L914 100µH 3225 :NLC
L915 100µH 3225 :NLC
L916 4.7µH 3225 :NLC
L917 4.7µH 3225 :NLC
LN0901
LN0902
LN0903
CN901 42P :B-TO-B (0-7)
42 HP R OUT
41 HP L OUT
40 LANC DC
39 HP GND
38 LANC SIG
37 CAM D/D ON
36 VTR D/D ON
35 DRUM ERR
34 CAP ERR
33 EVF 5V
32 EVF 15V
31 EVF UNREG
30 EVF UNREG GND
29 AU 5V
28 VTR UNREG
27 SS 3.6V
26 REG GND
25 CAM -9V
24 REG GND
23 D 5V
22 REG GND
21 CAM 15V
20 CAM 5V
19 CAM 5V
18 VID 5V
17 VID 5V
16 D3.6V
15 D3.6V
14 R/P 5V
13 MT5V
12 MT5V
11 DRUM VS
10 DRUM VS
9 CAP VS
8 CAP VS
7 MOTOR UNREG
6 MT UNREG GND
5 MOTOR UNREG
4 MT UNREG GND
3 MT5V
2 MT UNREG GND
1 RFU DC OUT
TO
VS-124 BOARD
(4/5)
CN504
(See Page 4-36)
HP L
HP GND
DN2
DN1
ERR2
ERR1
EVF15V
EVF5V
AU5V
CAM-8.5V
D5V
CAM15V
CAM5V
VI5V
RP5V
CAM15V
EVF15V
CAM-8.5V
CAM5V
DRUM-VS
CAP-VS
MT5V
CAM-9V
CL933 CL934
CL920
CL921 CL927
CL925 CL931
CL923 CL929
CL922 CL928
D5V
EVF5V
VI5V
AU5V
RP5V
L918 0
LANC
J902
R924 0
L919 0
D910 MA111-TX
HP L
C946 1000p
R932 0
R936 0
J903
HP GND
CL900
CL940
09

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

·SIGNAL PATH

	AUDIO SIGNAL
REC	
PB	⇨

·SIGNAL PATH

	REC	REC/PB	PB
Drum servo (speed and phase)		➤≫	
Capstan servo (speed and phase)		➤››	

SECTION 5
REPAIR PARTS LIST

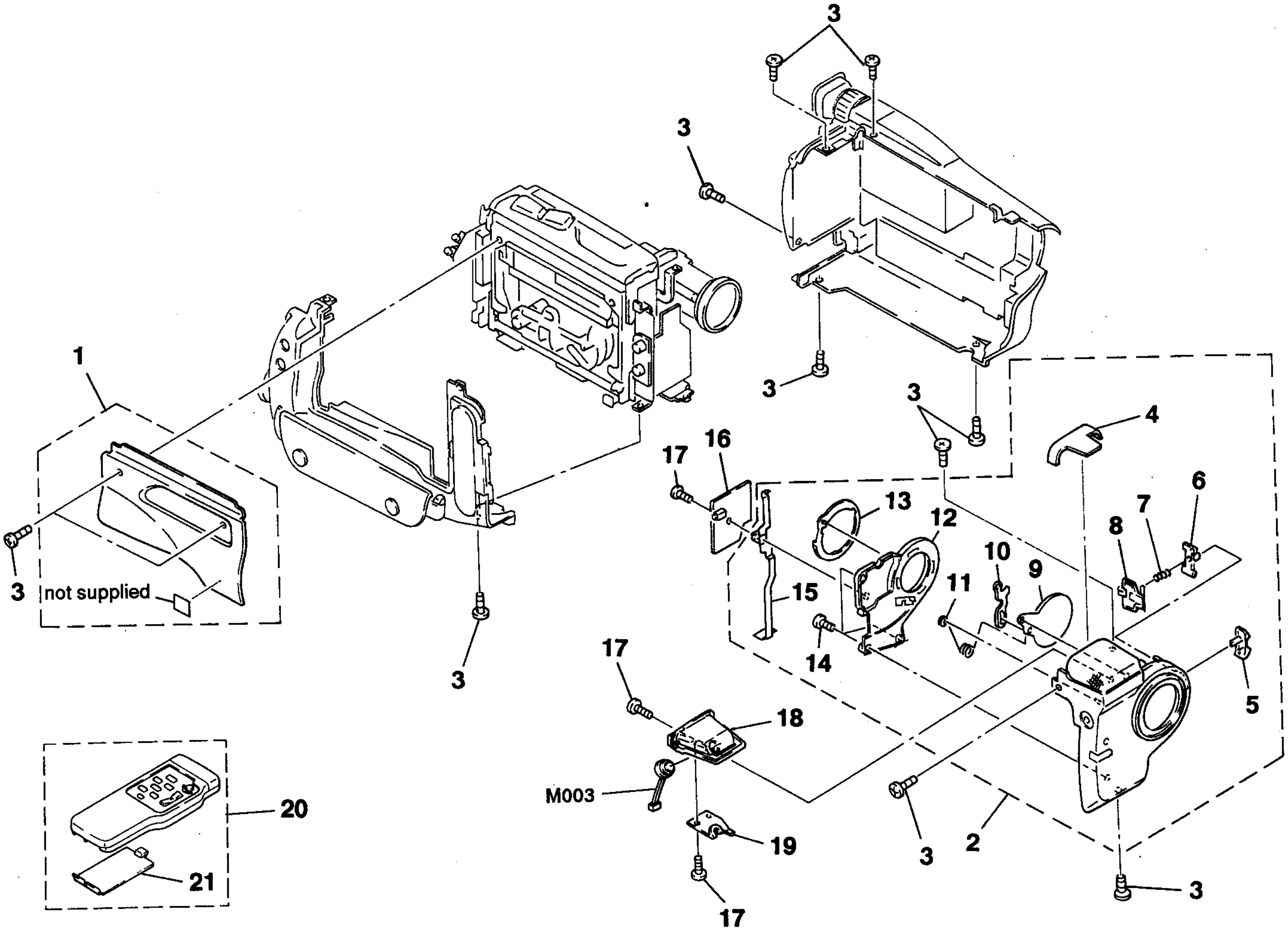
5-1. EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Hardware (# mark) list is given in the last of this parts list.
- Canadian model is abbreviated as CND. Hong Kong model is abbreviated as HK.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

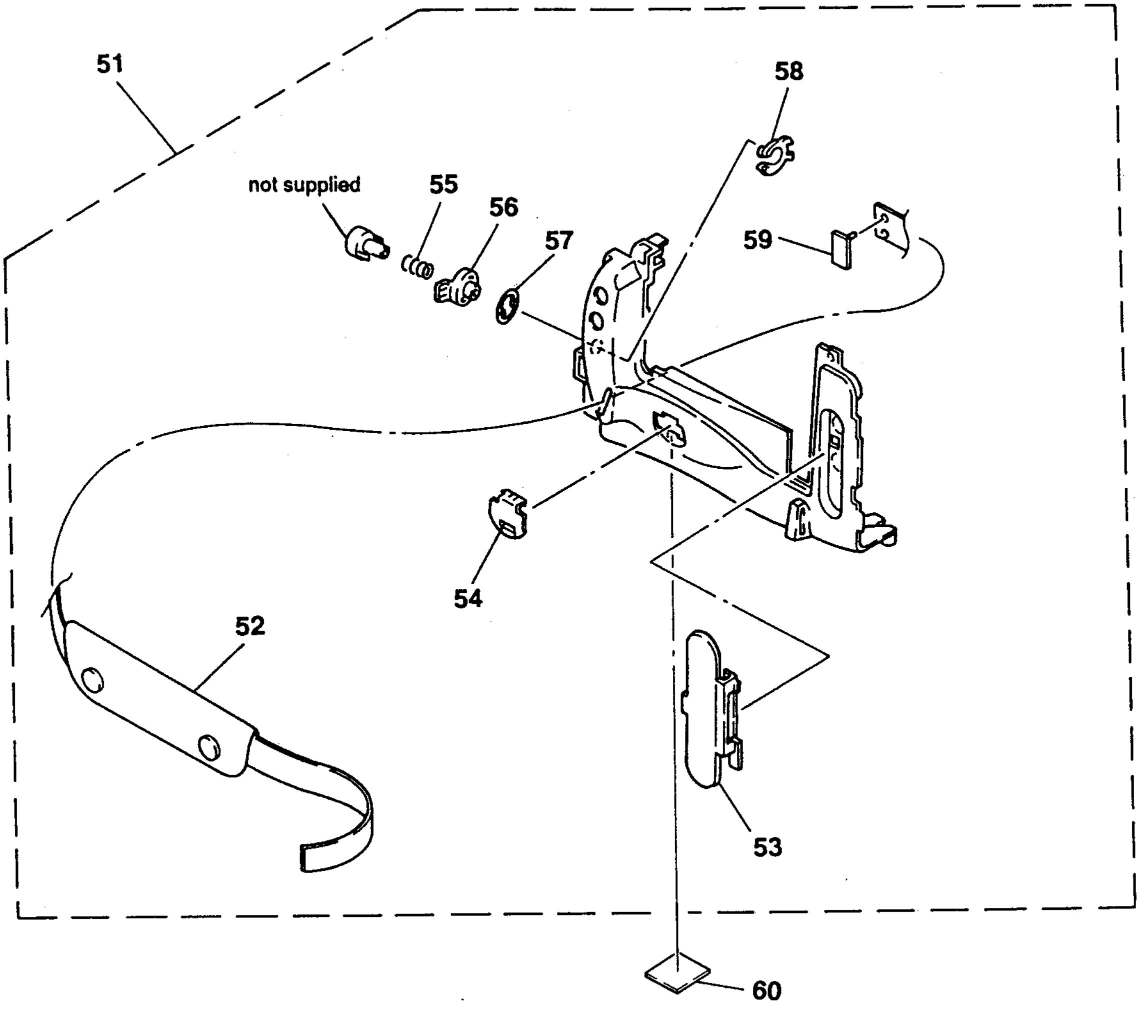
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

5-1-1. F PANEL BLOCK ASSEMBLY



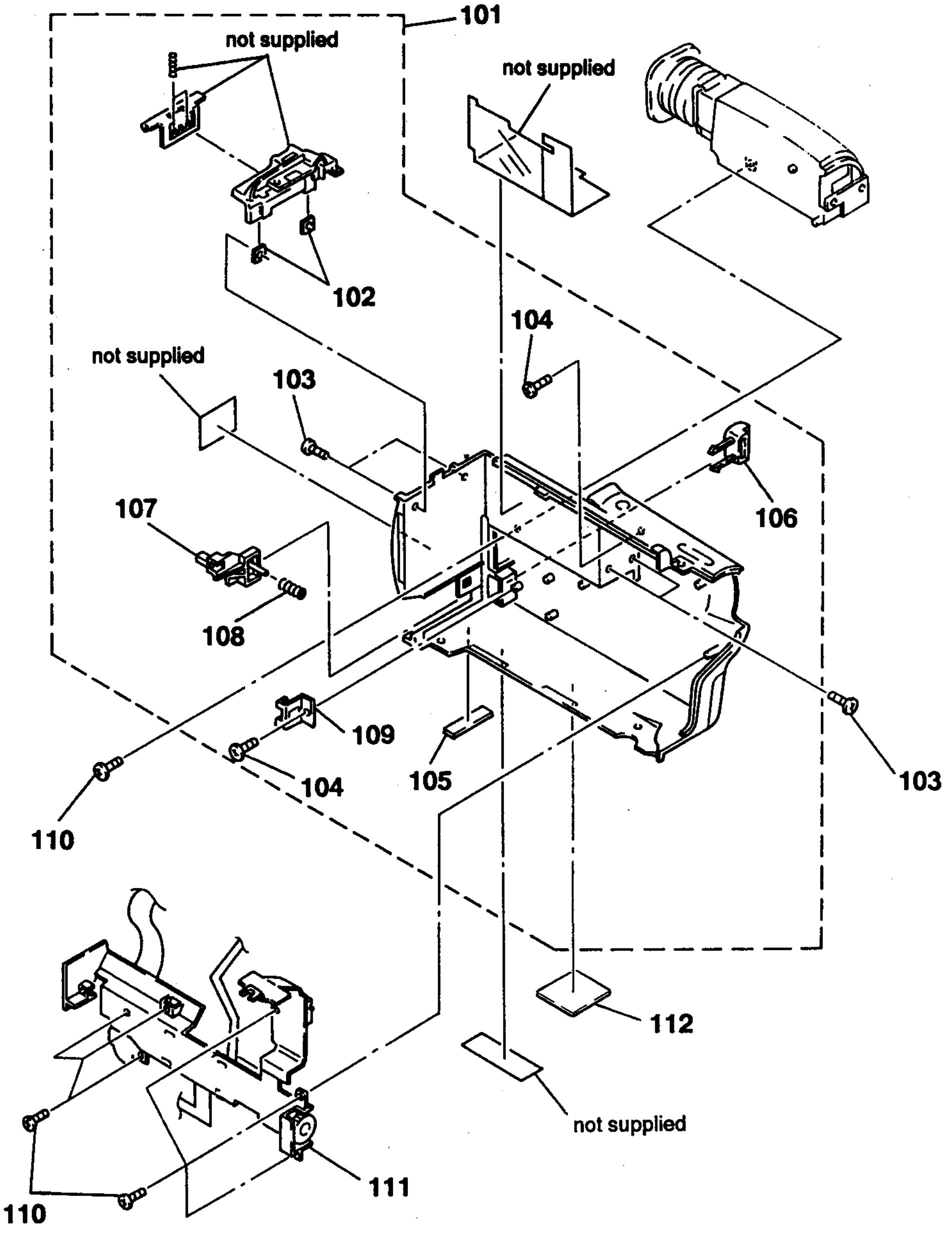
Ref. No.	Part No.	Description	Remark
1	X-3944-802-1	LID ASSY, CASSTTE	
2	X-3944-804-1	PANEL ASSY, FRONT	
3	3-719-381-01	SCREW (M2X4)	
4	3-958-610-01	CAP (M), MICROPHONE	
5	3-958-614-01	SWITCH, POWER	
6	3-958-633-01	BUTTON, POWER PUSH	
7	3-303-973-01	SPRING, COMPRESSION	
* 8	3-958-609-01	PLATE, FUNCTION, POWER	
9	3-958-616-01	COVER, LENS	
* 10	3-958-632-01	LEVER, LC	
11	3-958-637-01	SPRING, LC	
* 12	3-958-605-01	RETAINER, LC	
* 13	3-958-615-01	RING, DRIVING	
14	3-719-601-01	SCREW (B2X5), TAPPING	
* 15	3-958-953-01	PLATE, GROUND, MA	
* 16	A-7066-297-A	MA-231 BOARD, COMPLETE	
17	3-948-339-01	SCREW, TAPPING	
18	X-3944-801-1	HOLDER ASSY, MICROPHONE	
* 19	3-962-382-01	RETAINER (H), MICROPHONE	
20	1-467-574-21	REMOTE COMMANDER (RMT-708)	(EXCEPT TR380)
21	3-958-131-01	LID, BATTERY CASE (for RMT-708)	(EXCEPT TR380)
M003	1-542-259-11	MICROPHONE, CAP	

5-1-2. CABINET (L) BLOCK ASSEMBLY



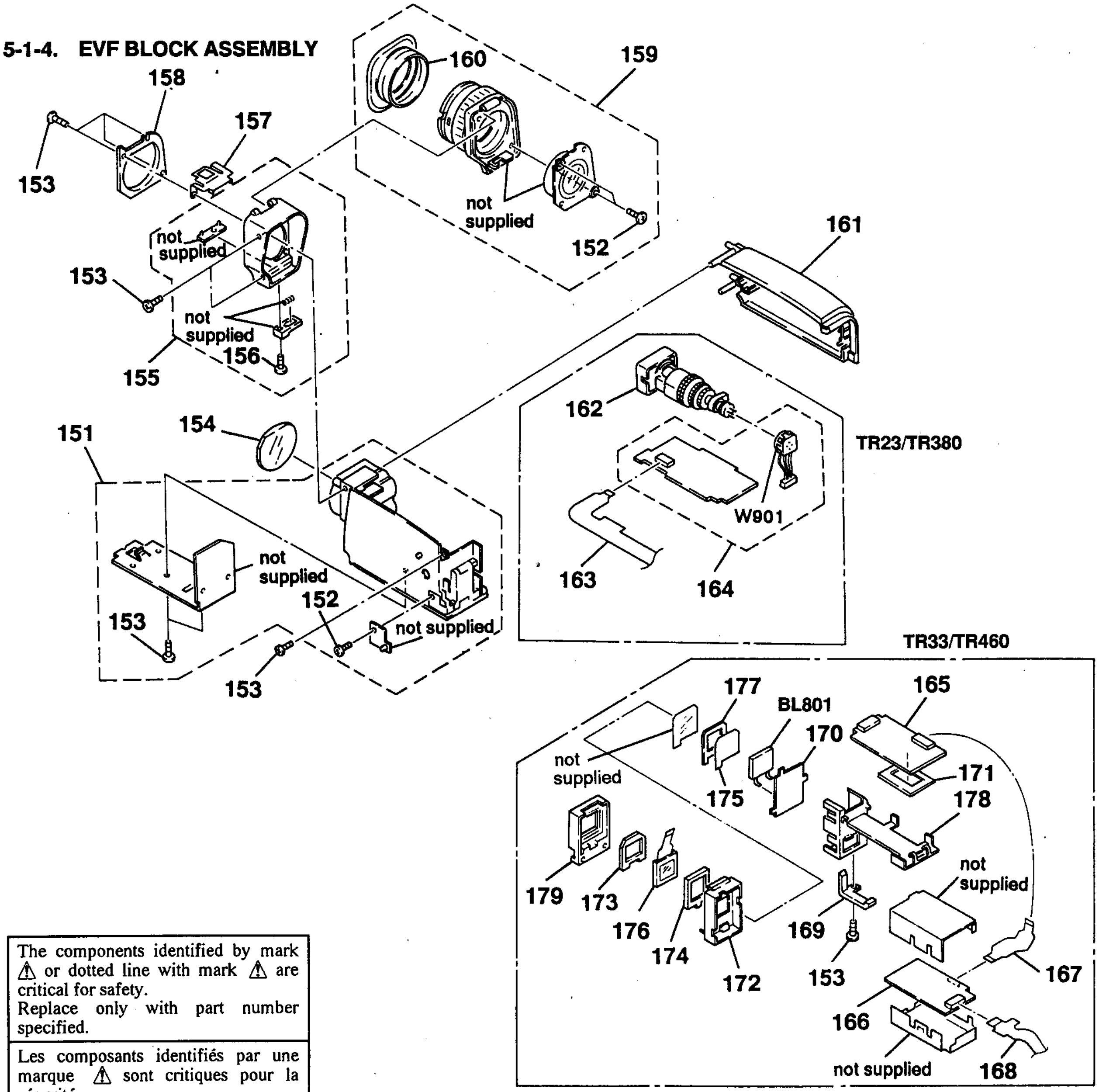
Ref. No.	Part No.	Description	Remark
51	X-3943-924-1	CABINET (L) ASSY	
52	3-736-807-01	BELT, GRIP	
53	3-958-606-01	COVER, JACK	
54	3-958-608-01	LID, LITHIUM POWER	
55	3-578-221-00	SPRING, COMPRESSION	
56	3-942-985-01	KNOB, STAND-BY	
57	3-736-364-01	SPRING	
58	3-942-953-01	HOLDER, STAND-BY KNOB	
59	3-942-895-01	STOPPER, BELT	
60	3-704-256-01	LABEL, CAUTION (TR33:US)	
60	3-964-317-01	LABEL, RECYCLE EMC (TR33:CND)	

5-1-3. CABINET (R) BLOCK ASSEMBLY


101
not supplied
not supplied
102
104
not supplied
103
107
106
108
109
104
105
103
110
112
not supplied
111
110

Ref. No.	Part No.	Description	Remark
101	X-3944-800-1	CABINET (R) ASSY (TR380)	
101	X-3944-891-1	CABINET (R) ASSY (TR23)	
101	X-3944-894-1	CABINET (R) ASSY (TR460)	
101	X-3944-903-1	CABINET (R) ASSY (TR33)	
102	3-718-233-01	NUT, PLATE	
103	3-719-381-01	SCREW (M2X4)	
104	3-719-601-01	SCREW (B2X5), TAPPING	
105	3-949-008-01	SHEET, FOOT	
106	3-958-618-01	BUTTON, BATTERY RELEASE	
107	3-958-620-01	CLAW, BATTERY LOCK	
108	3-426-508-00	SPRING, COMPRESSION	
109	3-958-650-01	RETAINER, BATTERY RELEASE	
110	3-948-339-01	SCREW, TAPPING	
111	1-467-676-11	SWITCH BLOCK, CONTROL (CK)	
112	3-954-355-01	LABEL (C), NI-CD RECYCLE	(TR23:CND)
112	3-957-897-01	LABEL, FAROUDJA RECYCLE FCC	(TR23:US/TR33:US)

5-1-4. EVF BLOCK ASSEMBLY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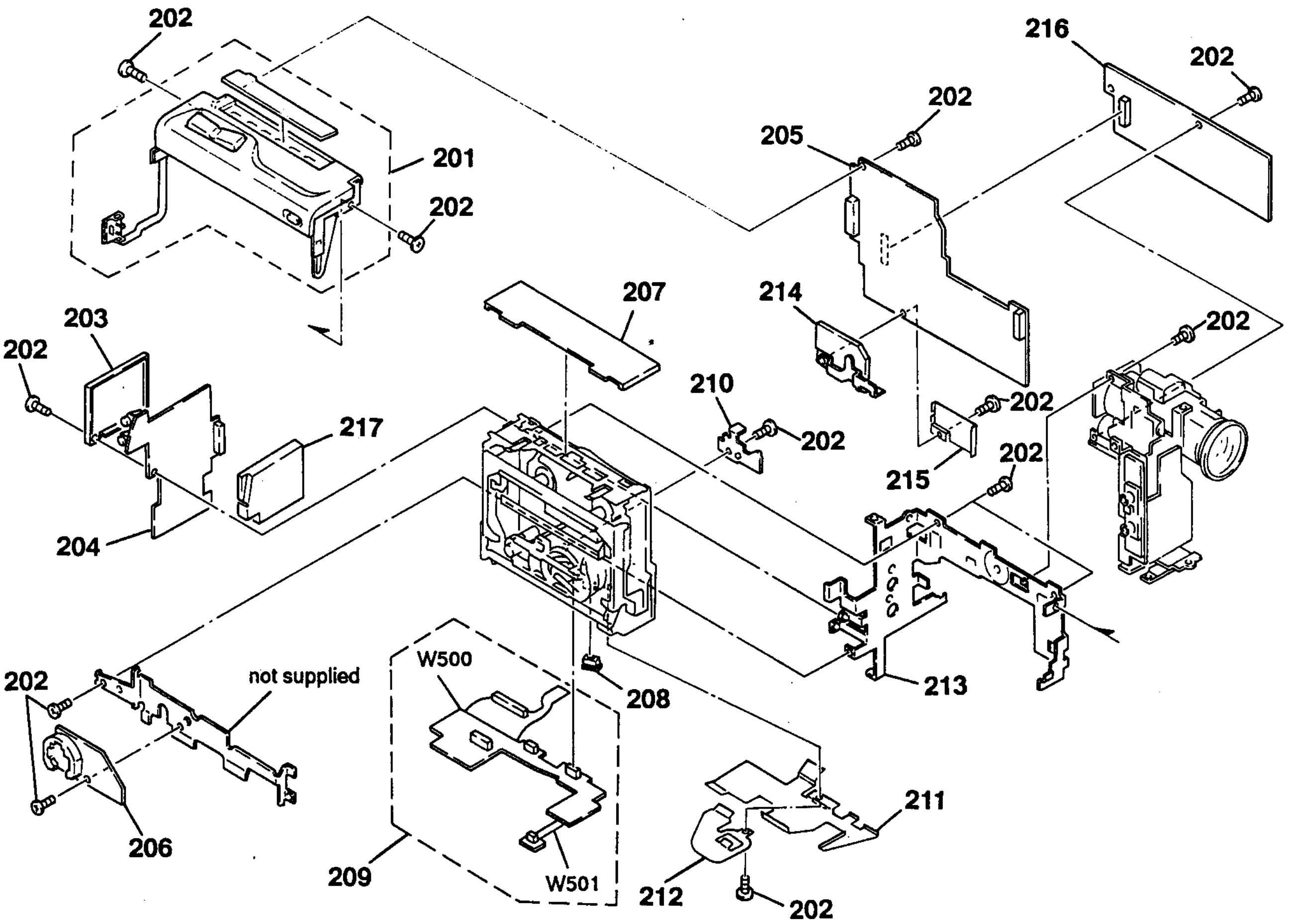
not supplied
156
155
162
TR23/TR380
151
154
W901
not supplied
152
163
164
153
not supplied
153
TR33/TR460
177
BL801
165
170
not supplied
171
175
178
not supplied
179
173
176
174
172
169
153
167
166
not supplied
168

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

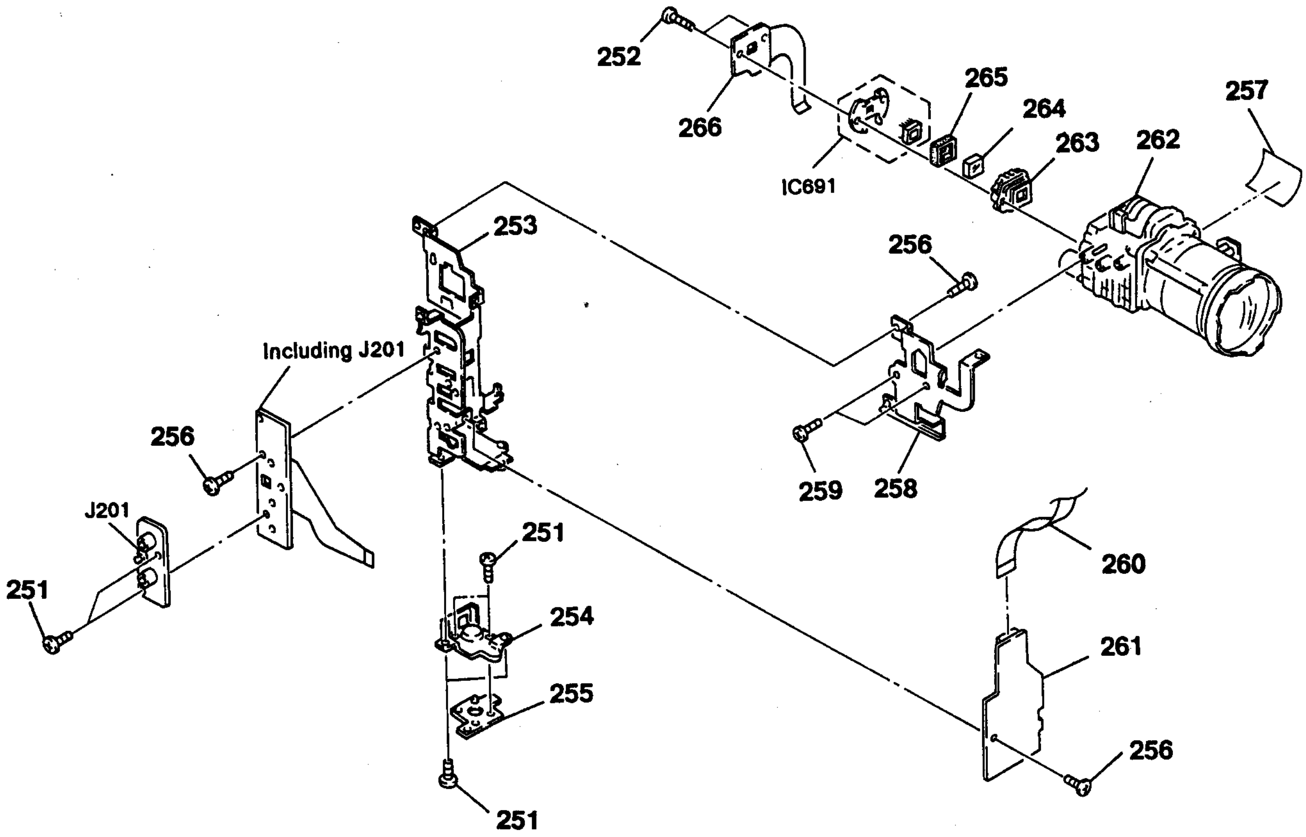
Ref. No.	Part No.	Description	Remark
151	X-3943-930-1	CABINET (L) ASSY, EVF (TR23/TR380)	
151	X-3944-004-1	CABINET (L) ASSY, EVF (TR33/TR460)	
152	3-713-791-51	SCREW (M1.7X3.5), TAPPING, P2	
153	3-948-339-01	SCREW, TAPPING	
154	3-958-627-01	LENS (1), VF (TR33/TR460)	
154	3-958-627-11	LENS (1), VF (TR23/TR380)	
155	A-7082-596-A	HOLDER (1) BLOCK ASSY, FINDER (TR23/TR380)	
155	A-7082-625-A	HOLDER (1) BLOCK ASSY, FINDER (TR33/TR460)	
156	3-958-217-01	SCREW (M2)	
157	3-958-629-01	SPRING, LEAF	
158	3-958-628-01	HOLDER (1), LENS	
159	A-7082-595-A	HOLDER (2) BLOCK ASSY, FINDER	
160	3-958-597-01	EYE CUP	
161	3-958-592-01	CABINET (R), EVF (TR23/TR380)	
161	3-958-592-11	CABINET (R), EVF (TR33/TR460)	
⚠162	1-452-673-11	CRT ASSY (M01KXX90WB)(TR23/TR380)	
163	1-651-894-11	FP-86 FLEXIBLE BOARD (TR23/TR380)	
* 164	A-7063-957-A	VF-65 BOARD, COMPLETE (TR23/TR380)	
* 165	A-7066-011-A	VF-67 BOARD, COMPLETE (TR33/TR460)	
⚠*166	A-7066-010-A	VF-66 BOARD, COMPLETE (TR33/TR460)	
167	1-651-903-11	FP-92 FLEXIBLE BOARD (TR33/TR460)	
168	1-651-893-11	FP-85 FLEXIBLE BOARD (TR33/TR460)	
169	3-958-969-01	CHIP (LCD), TALLY (TR33/TR460)	
* 170	A-7056-012-A	LB-35 BOARD, COMPLETE (TR33/TR460)	
* 171	3-960-109-01	PLATE, VF (TR33/TR460)	
172	3-958-962-01	COVER, BL (TR33/TR460)	
* 173	3-958-963-01	CUSHION (1)(TR33/TR460)	
* 174	3-958-964-01	CUSHION (2)(TR33/TR460)	
175	3-958-965-01	PLATE, CONDENCE, BL (TR33/TR460)	
176	8-753-015-00	LCX005AK-1 (TR33/TR460)	
* 177	3-958-967-01	CUSHION (3)(TR33/TR460)	
178	3-958-968-01	HOLDER (TR33/TR460)	
179	3-958-975-01	COVER, LCD (TR33/TR460)	
BL801	1-517-325-11	LAMP, FLUORESCENT (0.55 INCH) (TR33/TR460)	
⚠W901	1-540-019-21	SOCKET ASSY, CRT (TR23/TR380)	

5-1-5. MAIN BOARDS ASSEMBLY


202
216
202
202
205
201
202
207
214
203
202
202
210
217
202
202
215
202
204
213
202
not supplied
W500
208
211
206
209
W501
212
202

Ref.No.	Part No.	Description	Remark
201	1-467-649-81	SWITCH BLOCK, CONTROL (FK)	
202	3-713-786-21	SCREW (M2X3)	
* 203	3-958-925-01	CASE (MAIN), SHIELD, DD	
* 204	A-7066-294-A	DD-77(SL) BOARD, COMPLETE (TR23/TR380)	
* 204	A-7066-316-A	DD-77(SLC) BOARD, COMPLETE (TR33/TR460)	
* 205	A-7066-295-A	VS-124(SL) BOARD, COMPLETE (TR23/TR380)	
* 205	A-7066-317-A	VS-124(SLC) BOARD, COMPLETE (TR33/TR460)	
* 206	A-7072-168-A	ZB-2(SL) BOARD, COMPLETE	
207	3-958-341-01	COVER, LS	
208	1-691-471-11	CONNECTOR, TRANSLATION 11P	
* 209	A-7072-167-A	SL-38(SL) BOARD, COMPLETE	
* 210	3-958-667-01	FRAME (B)	
* 211	3-958-928-01	PLATE, SHIELD, RP	
212	1-651-891-11	FP-52 FLEXIBLE BOARD	
* 213	3-958-345-01	FRAME (U)	
* 214	X-3943-976-1	SHIELD (MAIN) ASSY, RP	
* 215	3-958-924-01	CASE (LID), SHIELD, RP	
* 216	A-7066-296-A	VC-160(SL) BOARD, COMPLETE	
* 217	3-958-926-01	CASE (LID), SHIELD, DD	
W500	1-651-889-11	FP-48 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-1-6. CCD BLOCK ASSEMBLY

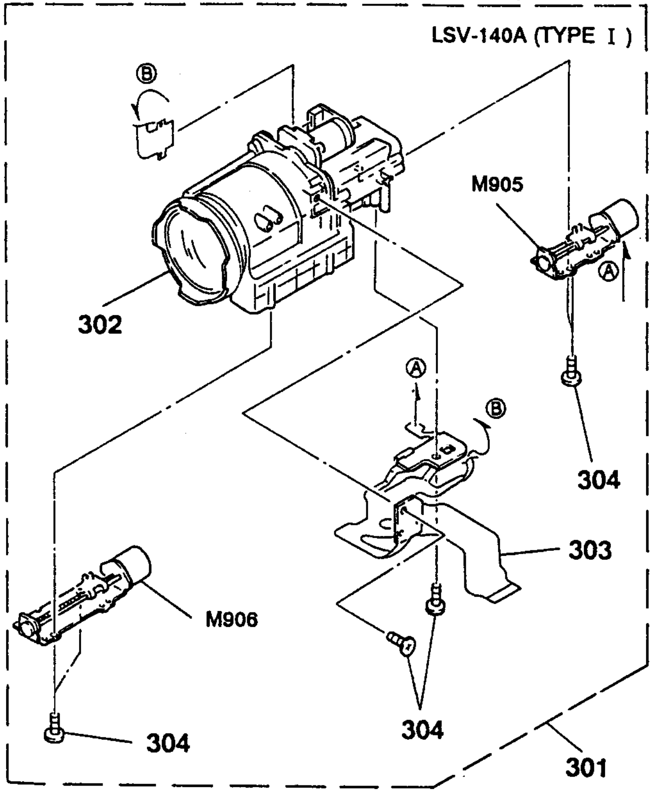


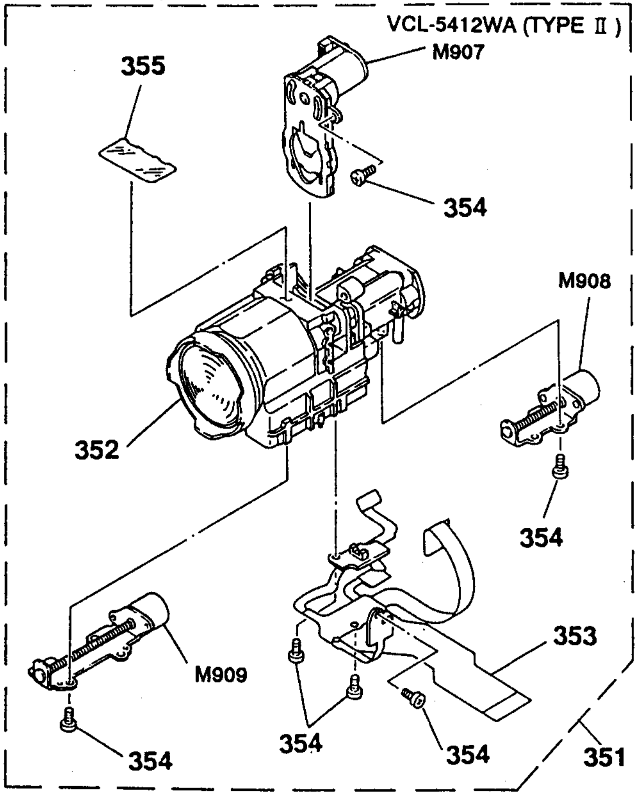
252
266
IC691
265
264
263
262
257
253
256
Including J201
256
J201
251
251
254
255
251
259
258
260
261
256

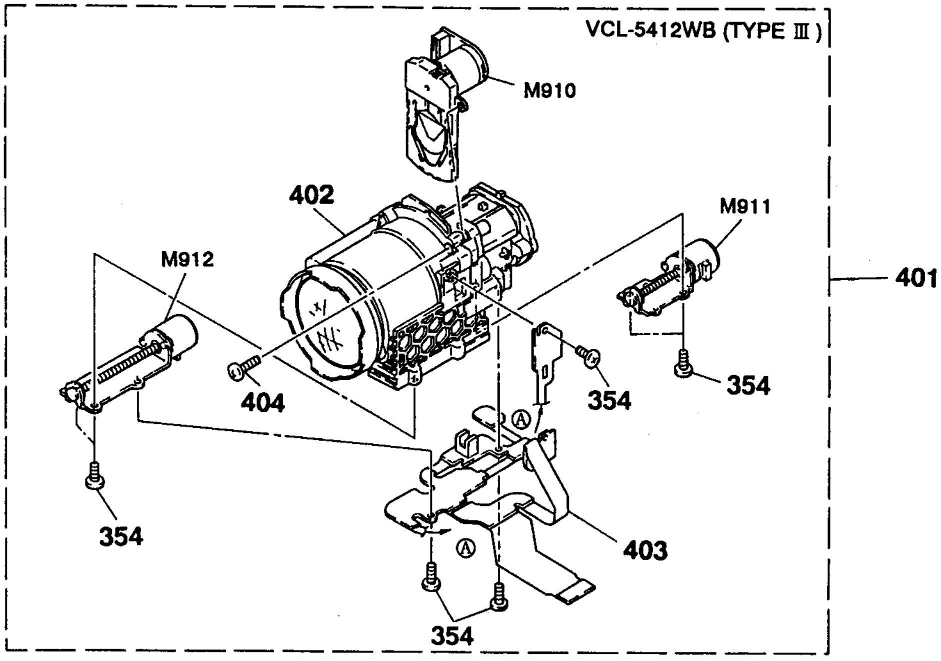
Be sure to read "Note on the CCD Imager replacement" on page 4–5 when changing the CCD imager.

Ref. No.	Part No.	Description	Remark
251	3-719-381-01	SCREW (M2X4)	
252	3-947-268-01	SCREW (P TIGHT)(2), TAPPING, +B	
* 253	3-958-587-01	FRAME (PJ)	
254	3-958-310-11	HOLDER, TRIPOD	
255	3-958-286-01	SHEET METAL, TRIPOD	
256	3-713-786-21	SCREW (M2X3)	
* 257	3-959-368-01	CUSHION, CABINET (R)	
* 258	3-958-666-01	FRAME (L)	
259	3-948-339-01	SCREW, TAPPING	
260	1-765-362-11	CABLE, FLAT (FFC-134)	
* 261	A-7066-293-A	AU-183 BOARD, COMPLETE	
262	1-547-716-11	LENS, ZOOM (VCL-5412WA)(TYPE II)	
262	1-547-739-11	LENS, ZOOM (VCL-5412WB)(TYPE III)	
262	8-848-704-01	DEVICE, LENS LSV-140A (TYPE I)	
263	3-946-856-01	ADAPTOR (H), CCD FITTING	
264	1-547-558-21	FILTER BLOCK, OPTICAL	
265	3-946-857-01	RUBBER (S), SEAL	
* 266	A-7072-135-A	CD-137 B BOARD, COMPLETE	
IC691	A-7030-368-A	CCD BLOCK ASSY (054 SERVICE)(CCD IMAGER)	
J201	1-537-731-11	TERMINAL BOARD	

5-1-7. ZOOM LENS ASSEMBLIES (LSV-140A) (VCL-5412WA) (VCL-5412WB)

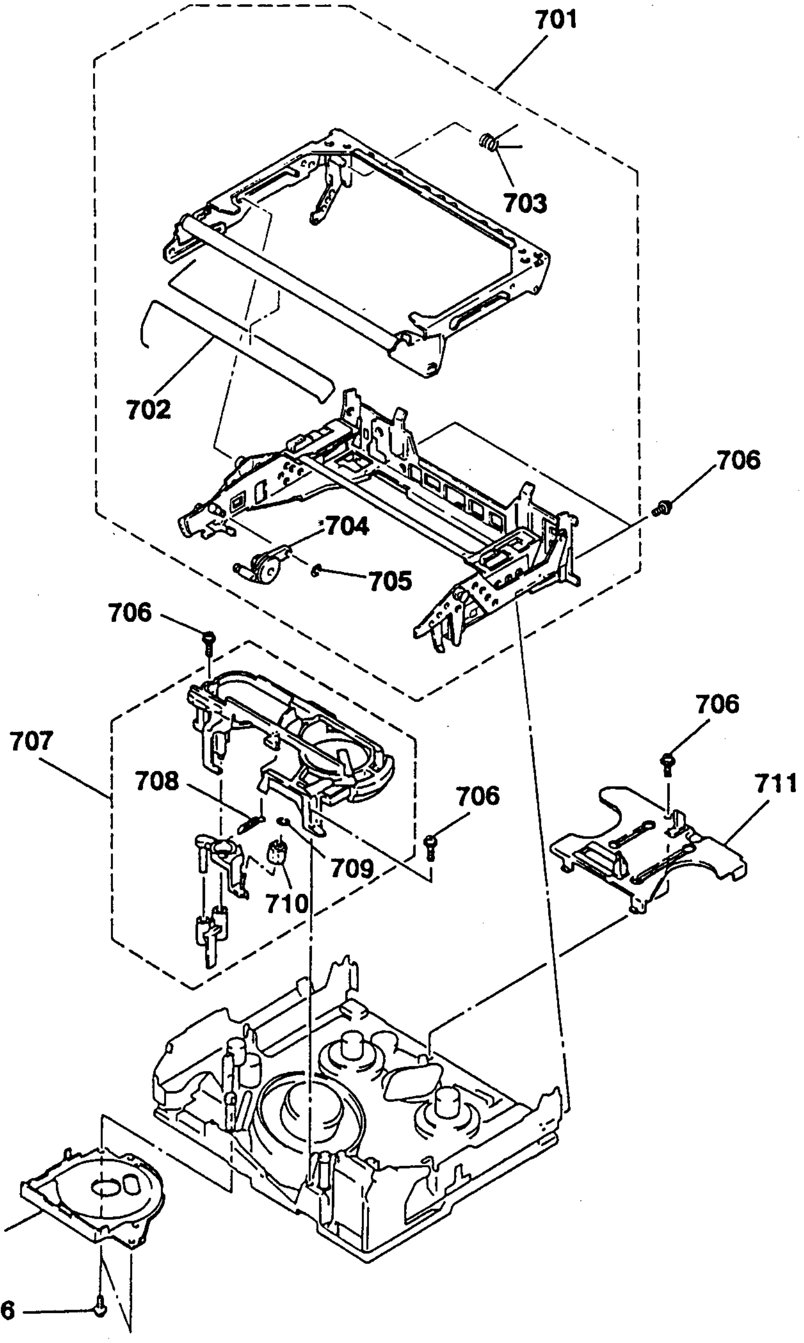

LSV-140A (TYPE I)
Ⓑ
M905
Ⓐ
302
Ⓐ
Ⓑ
304
303
M906
304
304
301


VCL-5412WA (TYPE II)
M907
355
354
M908
352
354
353
M909
354
354
354
351


VCL-5412WB (TYPE III)
M910
402
M911
M912
401
404
354
354
Ⓐ
354
403
Ⓐ
354

Ref. No.	Part No.	Description	Remark
301	8-848-704-01	DEVICE, LENS LSV-140A (TYPE I)	
302	A-4910-598-A	DEVICE ASSY, LSV-140A (RP)	
303	A-4915-338-A	FLEXIBLE MOUNT	
304	3-713-791-41	SCREW (M1.7X5), TAPPING, P2	
M905	1-698-364-01	MOTOR ASSY, FOCUS	
M906	1-698-363-01	MOTOR ASSY, ZOOM	
351	1-547-716-11	LENS, ZOOM (VCL-5412WA)(TYPE II)	
352	3-708-891-01	TUBE, MIRROR ASSY	
353	3-708-890-01	FLEXIBLE, MAIN	
354	3-708-302-01	SCREW (BT3 P1.7X4C)	
355	3-708-886-01	COVER, IG	
M907	3-708-888-01	METER, IG (IRIS)	
M908	3-708-889-01	MOTOR ASSY, FOCUS	
M909	3-708-887-01	MOTOR ASSY, ZOOM	
401	1-547-739-11	LENS, ZOOM (VCL-5412WB)(TYPE III)	
402	3-708-900-01	TUBE, MIRROR ASSY	
403	3-708-899-01	PC BOARD ASSY, FLEXIBLE	
404	3-708-617-01	SCREW (BT3 P1.7X7C)	
M910	3-708-898-01	IRIS ASSY	
M911	3-708-897-01	MOTOR ASSY, FOCUS	
M912	3-708-896-01	MOTOR ASSY, ZOOM	

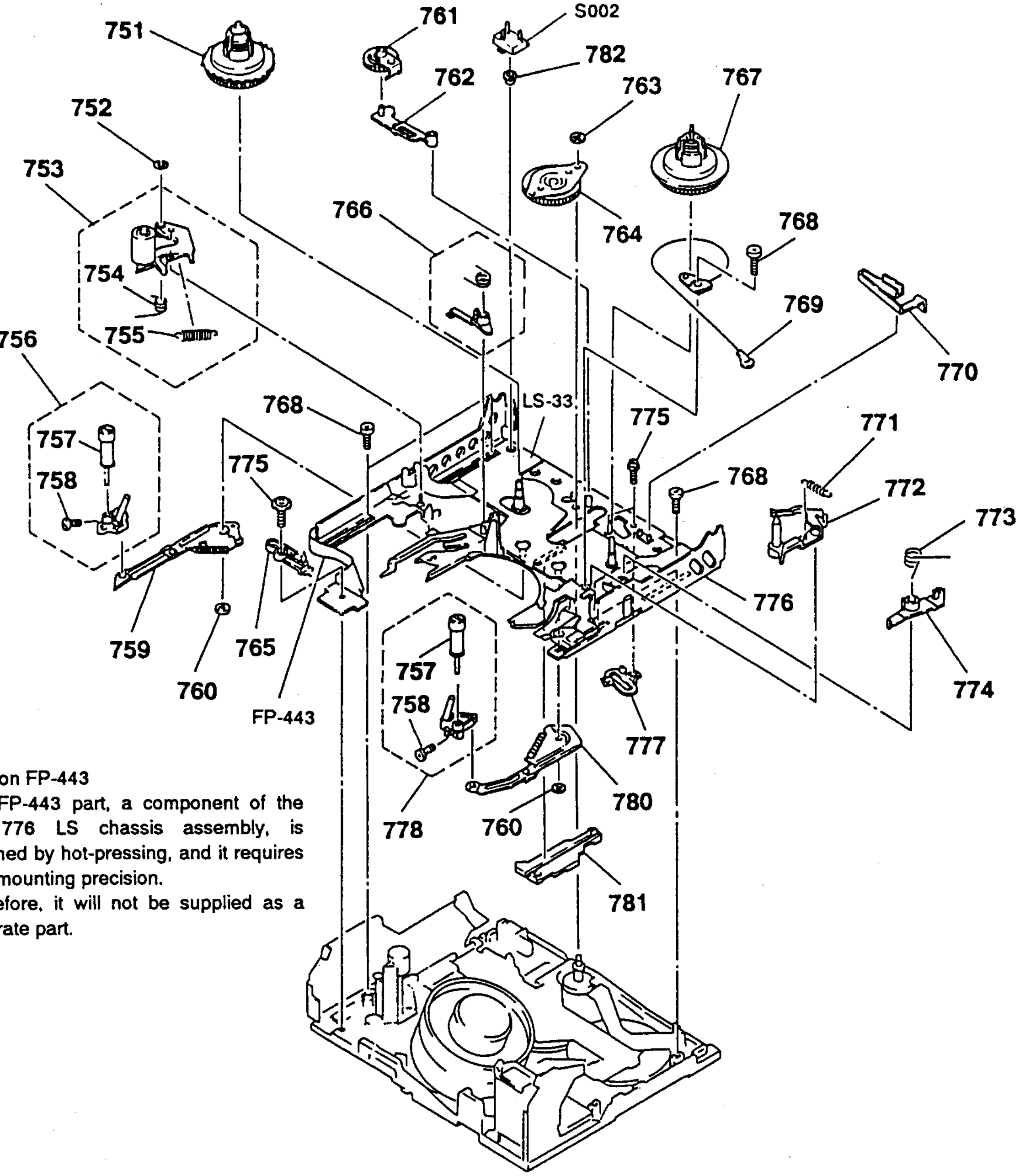
5-1-8. CASSETTE COMPARTMENT ASSEMBLY


701
703
702
706
704
705
706
706
707
708
706
711
709
710
712
706

Ref. No.	Part No.	Description	Remark
701	A-7040-312-K	CASSETTE COMPARTMENT BLOCK ASSY	
702	3-945-773-01	BAR, TORSION	
703	3-945-771-01	SPRING, TORSION	
704	X-3941-287-2	DAMPER ASSY	
705	3-315-384-31	WASHER, STOPPER	
706	3-947-503-01	SCREW (M1.4X2.5)	

Ref. No.	Part No.	Description	Remark
707	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
708	3-945-760-01	SPRING, TENSION	
709	3-321-393-01	WASHER, STOPPER	
710	X-3944-886-1	ROLLER ASSY, HC	
711	X-3941-280-1	RETAINER ASSY, GOOSENECK	
712	3-945-733-01	COVER, CAPSTAN	

5-1-9. LS CHASSIS ASSEMBLY


751
761
S002
782
762
763
767
752
753
766
764
768
754
769
755
756
770
768
LS-33
757
775
771
758
775
768
772
773
776
759
765
760
FP-443
757
758
774
777
780
778
760
781

Note on FP-443
The FP-443 part, a component of the No. 776 LS chassis assembly, is attached by hot-pressing, and it requires high mounting precision.
Therefore, it will not be supplied as a separate part.

Ref. No.	Part No.	Description	Remark
751	X-3941-274-1	TABLE ASSY, REEL, T	
752	3-331-007-21	WASHER	
753	X-3941-271-5	ARM ASSY, PINCH	
754	3-945-743-01	SPRING, TORSION	
755	3-945-783-01	SPRING, TENSION	
756	A-7040-307-A	GUIDE (BASE)(T) BLOCK ASSY	
757	X-3941-424-1	ROLLER ASSY, TG6	
758	3-947-504-01	SCREW (M1.2X2)	
759	X-3941-267-1	ARM (T) ASSY, GUIDE	
760	3-669-465-01	WASHER (1.5), STOPPER	
761	X-3941-273-1	SOFT ASSY, T	
762	3-945-753-01	ARM, T SOFT	
763	3-726-829-01	WASHER, STOPPER	
764	X-3941-279-5	GEAR ASSY, GOOSENECK	
765	3-947-644-01	RETAINER, TG5 (BASE)	
766	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
767	X-3944-116-1	TABLE ASSY, S REEL	
768	3-945-756-01	SCREW (M1.4X3)	
769	X-3941-277-1	STRING BLOCK ASSY	
770	3-945-801-01	BRAKE, S SOFT	
771	3-954-327-01	SPRING, TENSION	
772	X-3941-276-1	TG1 ASSY	
773	3-945-752-01	SPRING, TORSION	
774	3-945-799-01	BRAKE, S HARD	
775	3-947-503-01	SCREW (M1.4X2.5)	
776	X-3943-307-1	CHASSIS ASSY, LS	
777	3-945-784-01	PLATE, CAM, LS	
778	A-7040-323-A	GUIDE (BASE)(S) BLOCK ASSY	
780	X-3941-266-1	ARM (S) ASSY, GUIDE	
781	3-945-837-01	SLIDER, GL	
782	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

SECTION 6
ADJUSTMENTS

6-1. CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 6–28.

1-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

1-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Regulated power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Parts Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	White balance check
	ND filter 0.3	J-6080-818-A	White balance check
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote commander (RM-95-remodeled partly)[Note 1]	J-6082-053-B	
J-6	Siemens star	J-6080-875-A	For checking the flange back
J-7	Extension cable (42P, 0.8 mm)	J-6082-285-A	For extension between the VC-160 board (CN601) and VS-124 board (CN203)
J-8	Extension cable (9P, 0.8 mm)	J-6082-288-A	For extension between the FK board and VS-124 board (CN502)
	Extension cable (18P, 0.8 mm)	J-6080-289-A	For extension between the CK board and VS-124 board (CN503)

Note 1: If the micro processor IC in the adjusting remote commander is not the new micro processor (UPD7503G-C56-12), the pages cannot be switched. In this case, replace with the new micro processor (8-759-148-35).

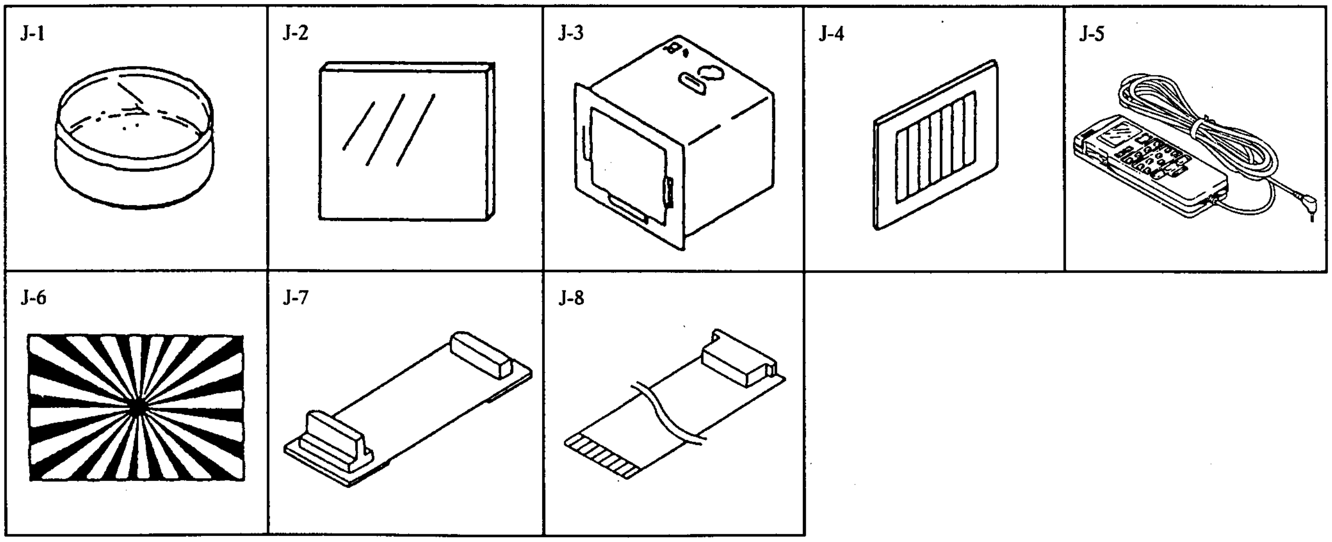


Fig. 6-1-1.

1-1-2. Preparations

Note 1: For further details of how to remove the cabinet and each board, refer to "2. Disassembly".

Note 2: When adjusting only, the lens block and VC-160 board need not be taken apart.

1) Connect the equipments for adjusting as shown in Fig. 6-1-3.
2) The F panel block (MA-231 board) is not required in adjustments. Remove the following connector.
   1. CN402 of the AU-183 board
3) If remove the cabinet (R) (Power switch, camera function switch and electronic view-finder), set to the camera power supply ON mode (Note 1), and disconnect the following connectors.
   1. CN503 of VS-124 board
   2. CN206 of VS-124 board
   3. CN101 of ZB-2 board

   Be sure to exit this mode after completing the adjustment. (Note 2)
4) Turning OFF the Auto Focus Using the Adjusting Remote Commander
   1. Set data: 01 to page: 6, address: 25.
      (The auto focus will turn OFF. The focus can be adjusted using the focus button on the adjusting remote commander. But the HOLD switch must be set to OFF.)
   2. After completing the adjustment/operation check, set data: 00 to page: 6, address: 25.

Note 1: Setting the Forced Camera Power Supply ON Mode
1) Set data: 01 to page: 1, address: 00.
2) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.

By carrying out the above, the camera can be operated even if the cabinet (R) has been removed. Be sure to exit the forced camera power ON mode after completing the adjustment.

Note 2: Exiting the Forced Camera Power Supply ON Mode
1) Set data: 01 to page: 1, address: 00.
2) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
3) Set data: 00 to page: 1, address: 00.

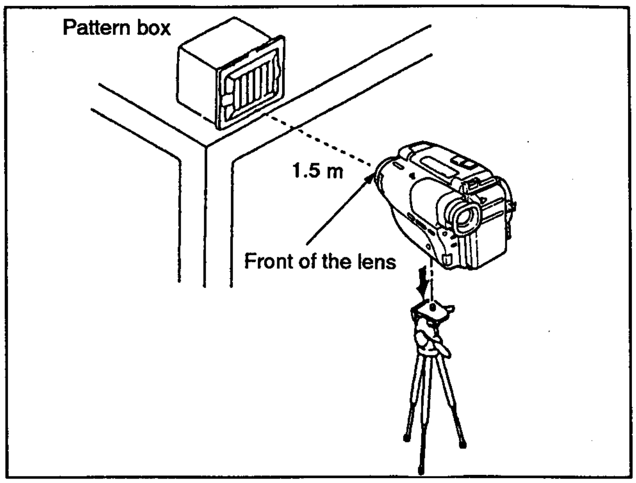


Fig. 6-1-2.

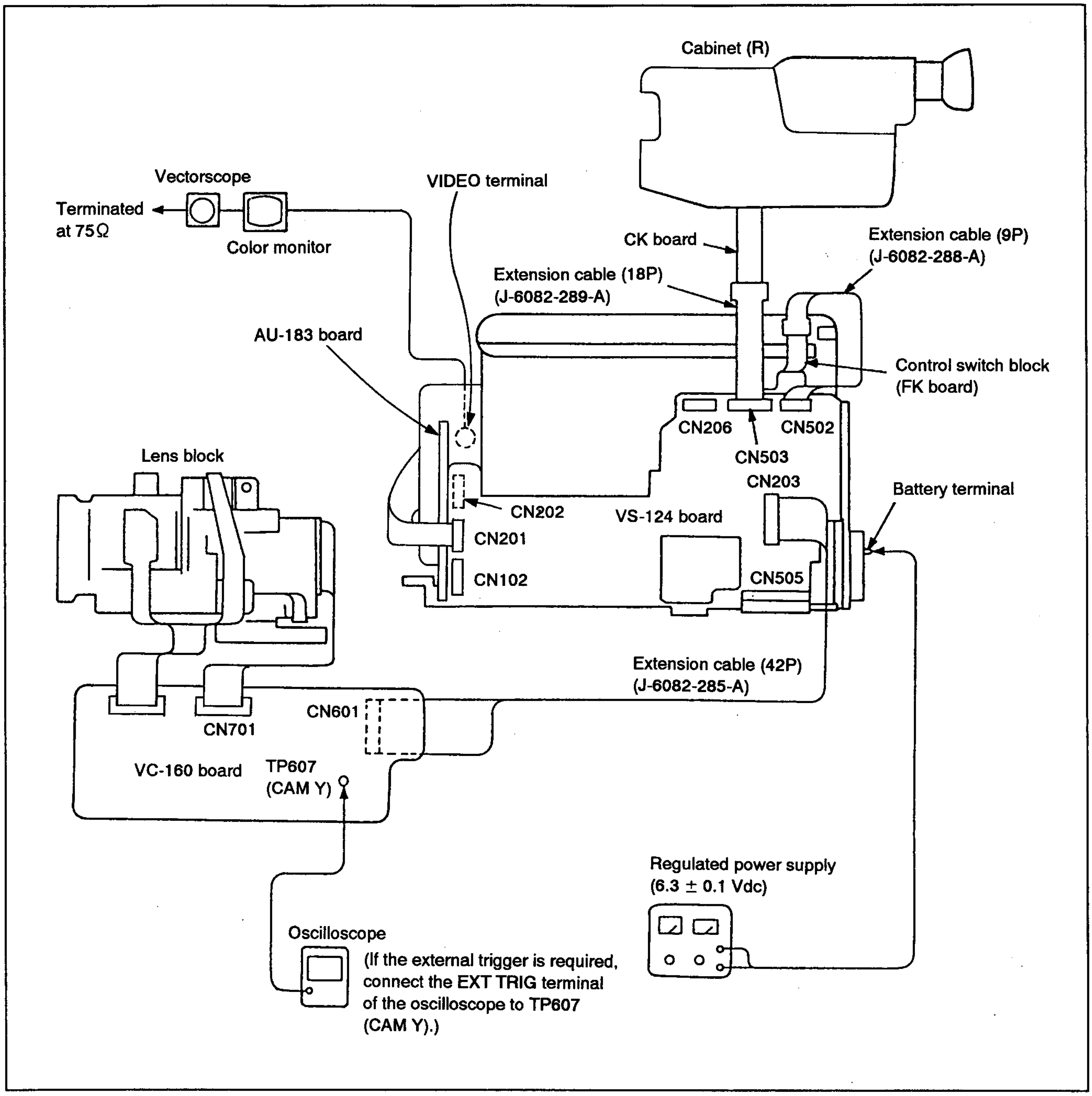

Cabinet (R)
Vectorscope
Terminated at 75Ω
Color monitor
VIDEO terminal
CK board
Extension cable (9P) (J-6082-288-A)
Extension cable (18P) (J-6082-289-A)
AU-183 board
Control switch block (FK board)
CN206
CN502
CN503
Lens block
CN203
Battery terminal
CN202
VS-124 board
CN201
CN102
CN505
Extension cable (42P) (J-6082-285-A)
CN601
CN701
VC-160 board
TP607 (CAM Y)
Regulated power supply (6.3 ± 0.1 Vdc)
Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to TP607 (CAM Y).)

Fig. 6-1-3.

1-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and adjust without loading the cassette tape, unless specified otherwise.

1. Camera/player power switch (Control switch block (CK board))······················Camera
2. Standby switch (Control switch block (FK board))··Standby
3. PROGRAM AE button (Control switch block (CK board)) ···Off
4. BACK LIGHT button (Control switch block (CK board)) ···Off

2. Adjusting Procedure

Adjust in the given order.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the picture frame as shown in Fig. 6-1-4. if adjustments are performed using the color bar chart. (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and so that the white pattern will be displayed.
   (Don't touch the zoom switch)

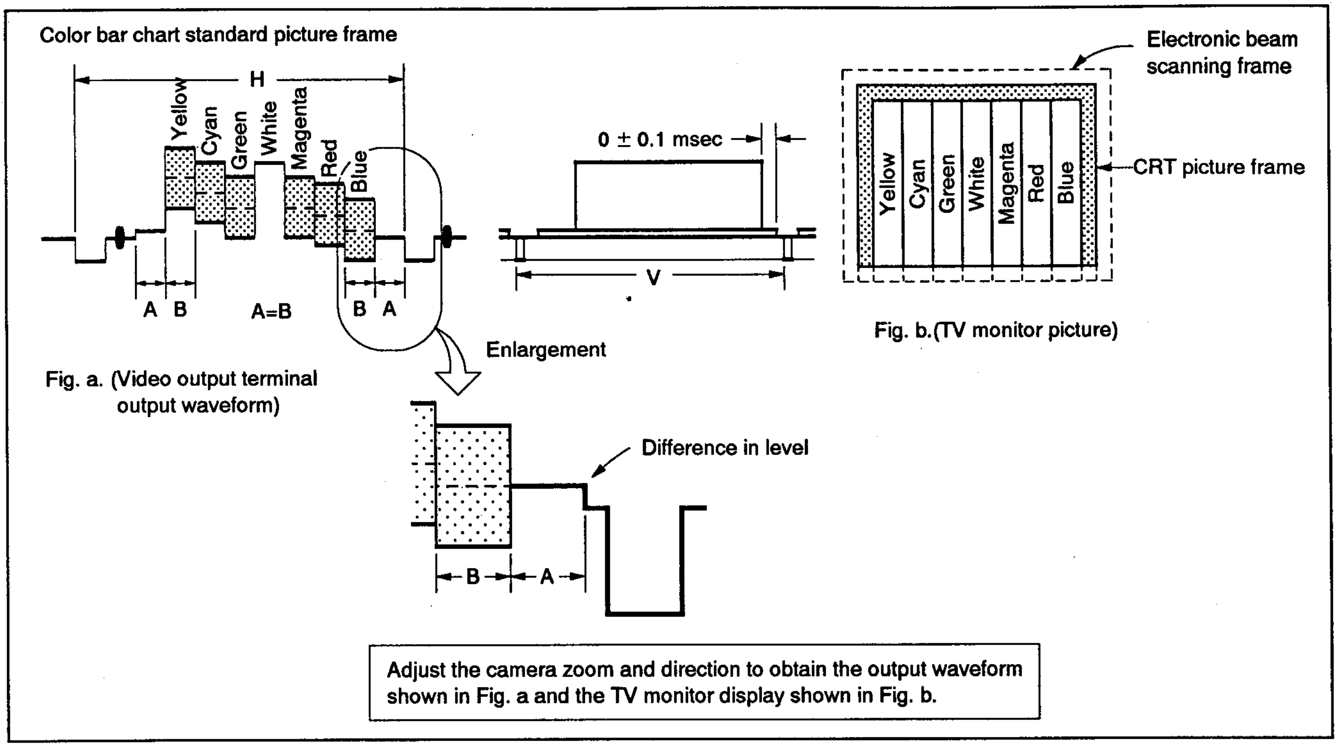

Color bar chart standard picture frame
H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
0 ± 0.1 msec
V
Enlargement
Difference in level
B
A
Electronic beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. a. (Video output terminal output waveform)

Fig. b.(TV monitor picture)

Adjust the camera zoom and direction to obtain the output waveform shown in Fig. a and the TV monitor display shown in Fig. b.

Fig. 6-1-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 6-1-5.

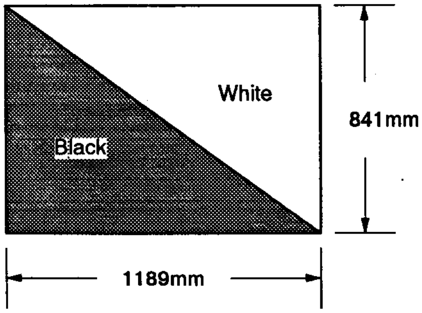

White
Black
841mm
1189mm

Fig. 6-1-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

1-1-4. Adjusting Remote Commander

Use the adjusting remote commander to change the coefficient of the digital signal processing or the EVR data.
The adjusting remote commander uses the remote commander signal line (LANC) to perform the bidirectional communication with the camera microprocessor. The effect data of the bidirectional communication must be written in the nonvolatile memory.

1. Using the adjusting remote commander

1) Connect the adjusting remote commander to the remote terminal.
2) Adjust the HOLD switch of the adjusting remote commander to "HOLD" (SERVICE position).

If it has been properly connected, the LCD on the adjusting remote commander will display as shown in Fig. 6-1-6.

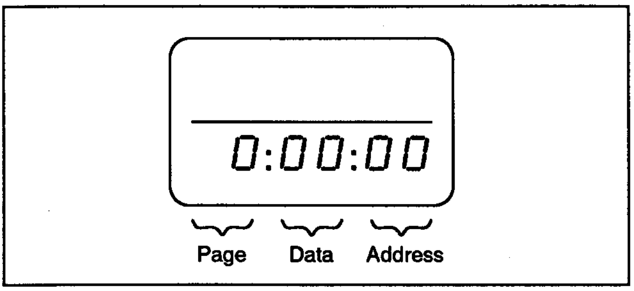


Fig. 6-1-6.

3) Operate the adjusting remote commander as follows.
   - Changing the page
     The page increases when the EDIT SEARCH+ button is pressed, and decreases when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Display	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 6-1-1.

   - Changing the address
     The address increases when the FF (▶▶) button is pressed, and decreases when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data increases when the PLAY (▶) button is pressed, and decreases when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     The PAUSE button must be pressed to write the adjustment data (F page) in the nonvolatile memory.
     (The new adjustment data will not be recorded in the nonvolatile memory if this step is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. Page F, and enables the camera section (Addresses 01 to BF of page F) to be adjusted.
5) After completing all adjustments, turn off the main power supply (6.3V) once.

2. Precautions upon using the adjusting remote commander

Mishandling of the adjusting remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

1-1-5. Page F Address List

Note 1: The data already listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are values just after executing "Page F Data Initialization" and "Page F Data Modification". They are different from the values after executing all adjustments.

Note 3: In some cases, data have been input to the page F addresses C0 to FF. This has no relation to the adjustments.

Address	Adjustment data	
	Initial value	Memo column
00	7C	7C
01	0A	0A
02	00	00
03	00	00
04	80	
05	80	
06	80	
07	80	
08	2D	
09	26	
0A	FA	
0B	F1	
0C	30	
0D	00	
0E	58	
0F	00	
10	E0	E0
11	8F	
12	6C	
13	36	
14	3C	
15	60	
16	0D	
17	A3	
18	12	
19	8E	
1A	10	
1B	E2	
1C	0C	0C
1D	00	00
1E	80	80
1F	80	80
20	79	79
21	79	79
22	00	00

Table 6-1-2 (1).

Address	Adjustment data	
	Initial value	Memo column
23	59	59
24	43	43
25	B5	B5
26	23	23
27	3F	3F
28	23	23
29	0B	0B
2A	10	10
2B	40	40
2C	FF	FF
2D	44	44
2E	17	17
2F	22	22
30	00	00
31	00	00
32	50	50
33	68	68
34	01	01
35	35	35
36	02	02
37	FD	FD
38	63	63
39	6A	6A
3A	50	50
3B	20	20
3C	C0	C0
3D	00	00
3E	00	
3F	00	
40	00	
41	00	
42	00	
43	00	
44	00	
45	00	
46	00	
47	00	
48	00	
49	00	
4A	00	
4B	00	
4C	00	
4D	00	

Table 6-1-2 (2).

Address	Adjustment data	
	Initial value	Memo column
4E	00	00
4F	20	20
50	13	13
51	02	02
52	66	66
53	18	18
54	66	66
55	9F	9F
56	66	66
57	66	66
58	59	59
59	83	83
5A	67	67
5B	5C	5C
5C	5C	5C
5D	4A	4A
5E	1E	1E
5F	5C	5C
60	3A	3A
61	33	33
62	0C	0C
63	26	26
64	24	24
65	02	02
66	04	04
67	05	05
68	00	00
69	00	00
6A	04	04
6B	00	00
6C	04	04
6D	00	00
6E	02	02
6F	33	33
70	B0	B0
71	18	18
72	0F	0F
73	0F	0F
74	02	02
75	63	63
76	1B	1B
77	F0	F0
78	A0	A0
79	30	30

Table 6-1-2 (3).

Address	Adjustment data	
	Initial value	Memo column
7A	10	10
7B	50	50
7C	58	58
7D	88	88
7E	66	66
7F	46	46
80	8F	8F
81	00	00
82	20	20
83	18	18
84	02	02
85	08	08
86	40	40
87	20	20
88	40	40
89	30	30
8A	50	50
8B	60	60
8C	80	80
8D	1D	1D
8E	50	50
8F	00	00
90	00	00
91	77	77
92	00	00
93	FB	FB
94	02	02
95	32	32
96	6B	6B
97	8D	8D
98	A1	A1
99	30	30
9A	30	30
9B	21	21
9C	91	91
9D	72	72
9E	00	00
9F	00	00
A0	00	00
A1	00	00
A2	00	00
A3	00	00
A4	02	02
A5	80	80

Table 6-1-2 (4).

Address	Adjustment data	
	Initial value	Memo column
A6	00	00
A7	80	80
A8	00	00
A9	80	80
AA	00	00
AB	80	80
AC	00	00
AD	00	00
AE	02	02
AF	44	44
B0	3D	3D
B1	1B	1B
B2	3D	3D
B3	25	25
B4	12	12
B5	4B	4B
B6	00	00
B7	20	20
B8	00	00
B9	05	05
BA	00	00
BB	20	20
BC	80	80
BD	00	00
BE	00	00
BF	00	00
C0 to FF		

Table 6-1-2 (5).

1-1-6. Data Processing

The calculation of the DDS display and the adjusting remote commander display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 6-1-3. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

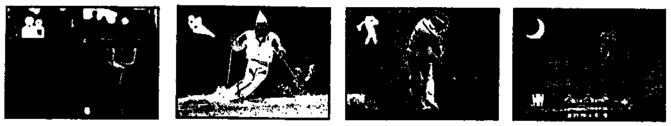
Table 6-1-3.

Using the PROGRAM AE Function

You can select from four PROGRAM AE (Auto Exposure) modes to suit your shooting situation. When you use PROGRAM AE, you can get a Portrait effect (the subject is in focus and the background is out of focus), capture high-speed action or night views.

Selecting the Best Mode

Select the best mode by using the following examples.



Portrait mode
- A still subject such as a person or flower
- Subject behind an obstacle such as a net
- Zooming in on a subject in telephoto

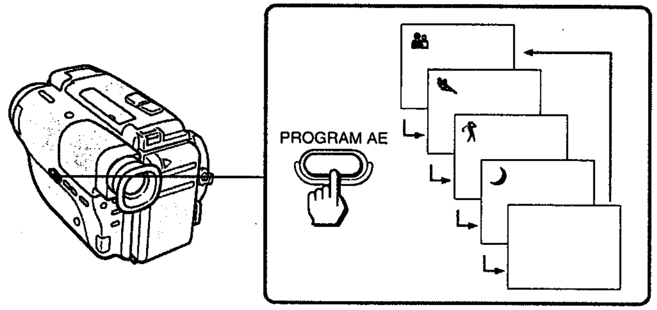
Sports mode
- Outdoor sports scenes such as football, tennis, golf or skiing
- A landscape in a moving car

High-speed shutter mode
- A golf swing or a tennis match in fine weather with the ball captured clearly
- Playing back certain scenes with high-speed movements in clear, sharp picture

Twilight mode
Recording night views neon signs or fireworks

Using the PROGRAM AE Function

Press PROGRAM AE repeatedly so that the desired mode indicator appears inside the viewfinder.



Note on shutter speed
The shutter speed in each PROGRAM AE mode is as follows:
Portrait mode – between 1/60 to 1/2000
Sports mode – between 1/60 to 1/500
High-speed shutter mode – 1/4000
Twilight mode – 1/60
Normal mode – 1/60

Fade-in and Fade-out

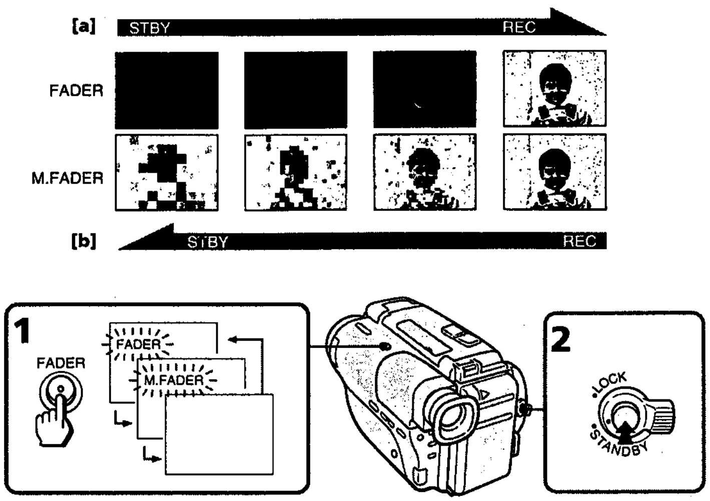
You can fade in or fade out to give your recording a professional appearance. When fading in, the picture will gradually appear from black or mosaic. The sound will also gradually increase. When fading out, the picture will gradually fade to black or mosaic. The sound will also decrease.

When Fading in [a]

(1) During the camcorder is in Standby mode, press FADER. The fade indicator starts flashing.
(2) Press START/STOP to start recording. The fade indicator stops flashing.

When Fading out [b]

(1) During recording, press FADER. The fade indicator starts flashing. **(2)** Press START/STOP to stop recording. The fade indicator stops flashing and recording stops.

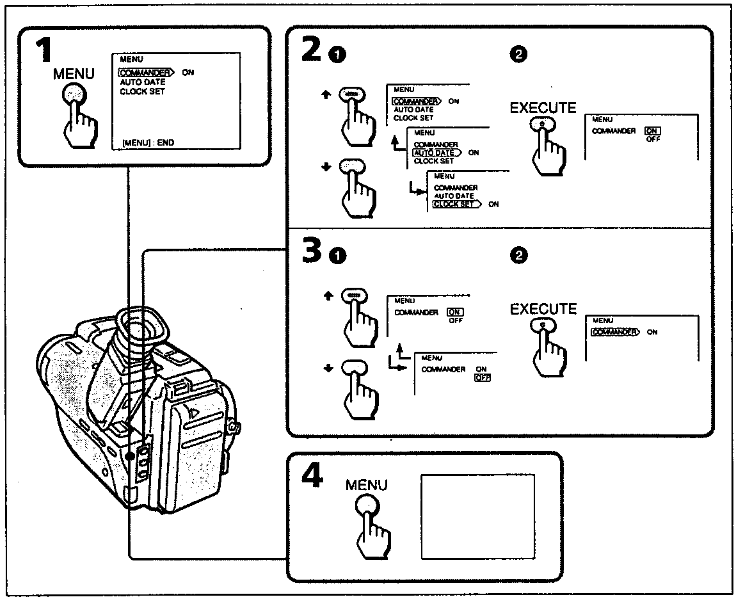


To Cancel the Fade-in/out Function
Before pressing START/STOP, press FADER once or twice until the fade indicator disappears.

When the date/time indicator is displayed
The date/time does not fade in nor fade out.

Changing the Mode Settings

You can change the mode settings in the menu system to further enjoy the features and functions.
(1) Press MENU to display the menu in the viewfinder. **(2)** Press ↑ or ↓ to select the desired item, then press EXECUTE. **(3)** Press ↑ or ↓ to set the desired mode, then press EXECUTE. If you want to change the other modes, repeat steps 2 and 3. **(4)** Press MENU to erase the menu display.


1
MENU
MENU
COMMANDER ON
AUTO DATE
CLOCK SET
[MENU] : END
2 ❶
❷
EXECUTE
MENU
COMMANDER ON
AUTO DATE
CLOCK SET
MENU
COMMANDER
AUTO DATE ON
CLOCK SET
MENU
COMMANDER
AUTO DATE
CLOCK SET ON
MENU
COMMANDER ON
OFF
3 ❶
❷
EXECUTE
MENU
COMMANDER ON
OFF
MENU
COMMANDER ON
OFF
MENU
COMMANDER ON
4
MENU

Note on BACK UP

When BACK UP indicator appears on the menu display, the settings of items are retained even when the battery is removed, as long as the lithium battery is in place.

Selecting the Mode Setting of Each Item

Common Items in CAMERA and PLAYER Modes

COMMANDER <ON/OFF>
- Select ON when using the supplied Remote Commander for the camcorder.
- Select OFF when not using the Remote Commander for the camcorder.

Items in CAMERA mode

AUTO DATE <ON/OFF>
- Select ON to record the date of recording automatically (AUTO DATE feature p. 12).
- Select OFF otherwise.

CLOCK SET
Select this item when you need to reset the clock (p. 28).

Items in PLAYER mode

EDIT <ON/OFF>
- Select ON to minimize the picture deterioration when editing.
- Normally select OFF.

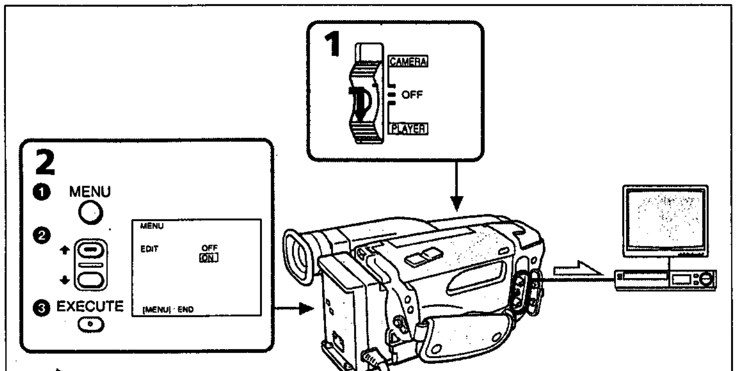
See the next page for further information.

Editing onto Another Tape

You can create your own video program by editing with any other 8 8 mm, Hi8 Hi8, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC, or β Betamax VCR that has video/audio inputs.

Before Editing

After connecting the camcorder to the VCR,
(1) Slide the POWER switch to PLAYER. **(2)** Set EDIT mode to ON in the menu system to minimise the picture deterioration (p. 25).



⇨ : Signal flow

Starting Editing

(1) Insert a blank tape (or a tape you want to record over) into the recording VCR. Then insert your recorded tape into the camcorder. **(2)** Play back the recorded tape on the camcorder until you locate the point where you want to start editing. Then set the camcorder to playback pause mode. **(3)** Set the recording VCR to recording pause mode. **(4)** Press ❚❚ on the camcorder and VCR simultaneously to start editing.

To Edit More Scenes

Repeat steps 2 to 4.

To Stop Editing

Press ■ STOP on the camcorder and VCR. When you finish editing, reset EDIT mode to OFF (p. 25).

Use of the EDITSEARCH button
To play back a tape in the forward or reverse direction keep pressing EDITSEARCH during playback pause. You can play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

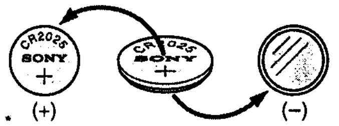
Note on DISPLAY function
If you have displayed the viewfinder screen indicators on the TV (DISPLAY function), erase the indicators by pressing DISPLAY on the Remote Commander so that they will not be superimposed on the edited tape.

Additional Information

Changing the Lithium Battery In the Camcorder

Your camcorder is supplied with the lithium battery installed. The lithium battery lasts for about 1 year under normal operation. When the battery becomes weak or dead, ⚡ indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with the Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**

Note on Lithium Battery
Note that the lithium battery has a positive (+) and a negative (–) terminals as illustrated. **Be sure to install the lithium battery so that terminals on the battery match the terminals on the camcorder.**

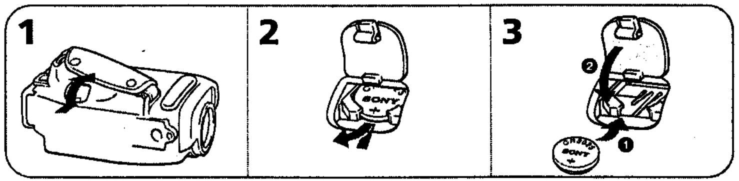


WARNING
The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution
Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.

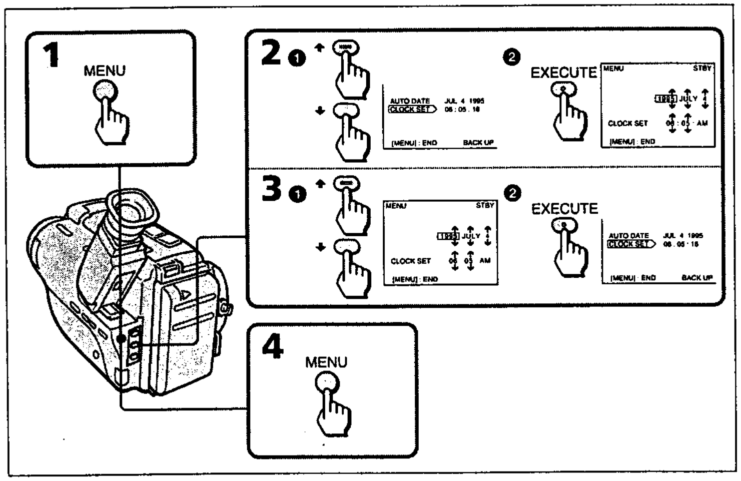
Changing the Lithium Battery

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date, time and the other items with BACK UP indicator in the menu system. **(1)** Open the lid of the lithium battery compartment. **(2)** Push the battery down once and pull it out from the holder. **(3)** Install the lithium battery with the positive (+) side facing out. Close the lid of the battery compartment.



Resetting the Date and Time

Reset the date and time in the menu system.
(1) Press MENU to display the menu.
(2) Press ↑ or ↓ to select CLOCK SET item (p. 25). Press EXECUTE.
(3) Set year, month, day, time, minute by pressing ↑, ↓ and EXECUTE. Note that when you keep ↑ and ↓ pressed, the digits advance faster.
(4) Press MENU to erase the menu display.



To Correct the Date and Time Setting

Repeat steps 2 to 3.

To Check the Date and Time

Press DATE to display the date indicator in the viewfinder. Press TIME to display the time indicator. When you press the same button again, the indicator goes out.

The year indicator changes as follows:

1995 ↔ 1996 ←·····→ 2024

Note on the time indicator
The internal clock of the camcorder operates on a 12-hour cycle.
12:00:00 AM stands for midnight. 12:00:00 PM stands for noon.

Playback Modes

The playback mode is selected automatically according to the recording system (SP/LP mode) in which the tape was recorded.

LP (long play) mode
When you play back a tape recorded in LP mode, the LP indicator lights up in the viewfinder. This camcorder cannot record tape in LP mode.

Foreign 8 mm video
You cannot play software recorded on a different TV color system. Because the TV color systems differ from country to country, you may not be able to play back foreign pre-recorded software. Refer to page 35 to check the TV color system of foreign countries.

Tips for Using the Battery Pack

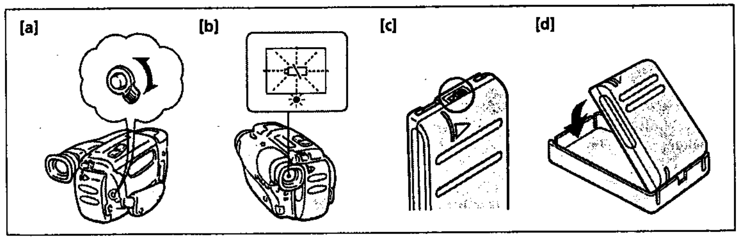
This section shows you how you can get the most out of your battery pack.

Preparing the Battery Pack

Always Carry Additional Batteries
Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.

Battery Life is Shorter in Cold Environment
Battery efficiency is decreased and the battery will be used up more quickly if you are recording in cold environment.

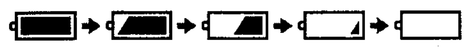
To Save Battery Power
Turn the STANDBY switch on the camcorder down when not recording to save battery power. [a]
A smooth transition between scenes can be made even if recording is stopped and started again. While positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.



Tips for Using the Battery Pack

When to Replace the Battery Pack

While you are using your camcorder, the remaining battery indicator decreases gradually as battery power is used up.



When the remaining battery indicator reaches the lowest point, the ▭ indicator appears and starts flashing in the viewfinder. **[b]** on page 29.
When the ▭ indicator in the viewfinder changes from slow flashing to rapid flashing while you are recording, slide the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain smooth transition between scenes after the battery pack is replaced.

Note on the remaining battery indicator

The remaining battery indicator of the camcorder may indicate a different remaining capacity from that of the battery pack with the remaining battery indicator (not supplied). The indicator of the battery pack is more accurate.

Notes on the Rechargeable Battery Pack

The Battery Heats Up

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern.

Battery Care

- Remove the battery pack from the camcorder after using the battery pack, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF, which shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore, you should charge the battery right before using the camcorder.

How to Use the Switch on the Battery Pack

This switch is provided so that you can mark the charged battery. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up (or in whichever direction you want to remind yourself). **[c]** on page 29.

The Life of the Battery Pack

If the ▭ indicator flashes rapidly just after turning on the camcordrer with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Charging Temperature

You should charge batteries at temperatures from 50°F to 86°F (from 10°C to 30°C). Lower temperatures require a longer charging time.

Sony Batteries are Recommended

Use of non-Sony batteries may damage your Handycam camcorder.

Notes on Charging

A Brand-new Battery

A brand-new battery pack is not charged. Before using the battery pack, charge it completely.

Before Recharging a Used Battery Pack

- Make sure to use up the battery before recharging.
- If recording is completed before the ▭ indicator appears in the viewfinder, you should remove the tape, slide the POWER switch to CAMERA, turn STANDBY up, and leave the camcorder until the battery indicator flashes rapidly.
- When you use the AC-S10 power adaptor, you can use the discharging function.
- **Charging the usable battery causes a lowering of battery capacity. Battery capacity can be recovered if you fully discharge and charge the battery again.**

After Long Storage

Recharge the battery pack after a long period of storage. If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Notes on the Terminals

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, repeat installing and removing the battery pack. This improves the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Be Sure to Observe the Following

- **To prevent an accident caused by a short circuit, do not allow metal objects such as a necklace to touch the battery terminals. Carry the battery pack attaching to the terminal cover. [d] on page 29.**
- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor convert the battery pack.
- Do not expose the battery pack to any mechanical shock.

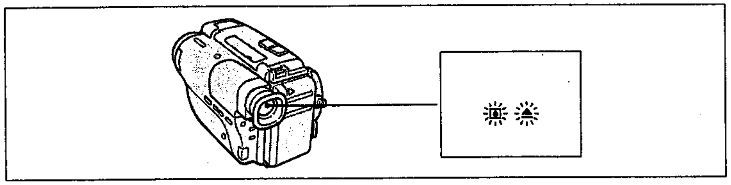
Maintenance Information and Precautions

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. If this happens, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

Inside the Camcorder

When ▣ and ⏏ indicators flash in the viewfinder, moisture has condensed inside the camcorder. If this happens, none of the functions except cassette ejection will work.
Eject the cassette turn off the camcorder, and leave it with the cassette compartment open for about 1 hour.
If the ▣ indicator does not light up when you turn on the power, you can use the camcorder again.



On the Surface of the Tape

If there is moisture on the surface of the tape, when you insert cassette and press a tape transport button (► PLAY , etc.), the ⏏ indicator flashes in the viewfinder. If this happens, none of the functions except cassette ejection will work.
Eject the cassette and leave it for about 1 hour.
If the ⏏ indicator does not light up when you insert the cassette and press a tape transport button, you can use the camcorder again.

On the Lens

No indicator will appear, but the picture becomes dim. Turn off the power and do not use the camcorder for about 1 hour.

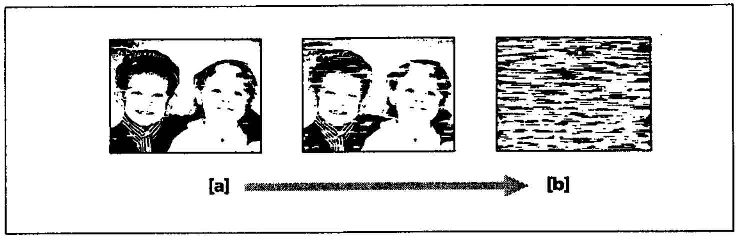
How to Prevent Moisture Condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

(1) Be sure to tightly seal the plastic bag containing the camcorder.
(2) Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about one hour).

Video Head Cleaning

To ensure clear pictures, clean the video heads periodically. When playback pictures are "noisy" or hardly visible, the video heads may be contaminated.



[a] Slight contamination
[b] Critical contamination

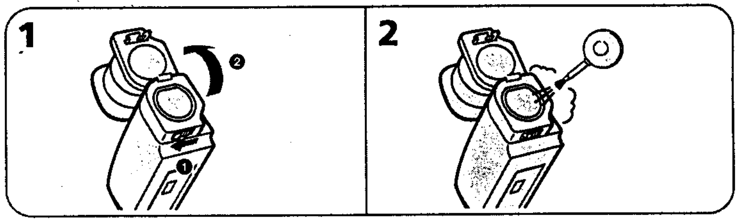
If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than 5 times.)

Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your nearest Sony dealer.

Removing Dust from inside the Viewfinder

(1) While sliding the viewfinder release knob to the left, flip open the viewfinder. **(2)** Clean the surface with a commercially available blower.



Maintenance Information and Precautions

Precautions

Camcorder Operation

- Operate the camcorder using 6.0 V (battery pack), or 7.5 V (AC power adaptor).
- For DC or AC operation, use only the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by your nearest Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.

On Handling Tapes

Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type, thickness of tape, or if the tab is out or in.

Camcorder Care

- When the camcorder is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean the camcorder body with a soft dry cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

AC Power Adaptor

Charging

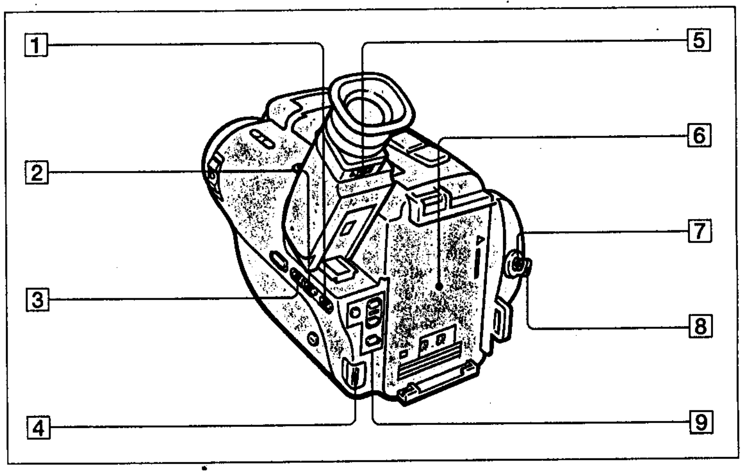
- Use only for the specified battery pack. This unit cannot be used to charge a lithium ion type battery.
- Attach the battery pack firmly.
- Charge the battery pack on a flat surface without vibration.

Others

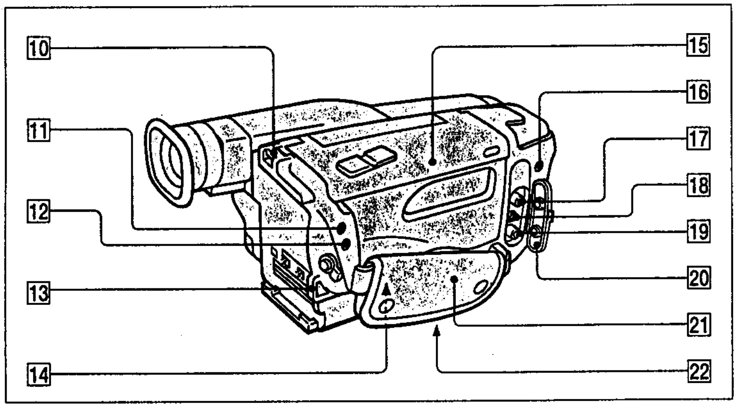
- The model for USA or Canada: One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Unplug the unit from the wall (mains) outlet when not in use for a long time. To disconnect the cord (mains lead), pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the AC power cord forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or an electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If this happens, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- The unit becomes warm while in use. This is normal.
- Do not place the unit in locations that are:
  - Extremely hot or cold
  - Dusty or dirty
  - Very humid
  - Vibrating

If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

Identifying the Parts



1 **COUNTER RESET button (p. 12)**
2 **TIME button (p. 20)**
3 **DATE button (p. 20)**
4 **BATT (battery) release knob (p. 8)**
5 **Viewfinder release knob (p. 14, 33)**
6 **Battery mounting surface (p. 8)**
7 **START/STOP button (p. 11)**
8 **STANDBY switch (p. 10, 11)**
9 **Menu operation buttons (p. 24, 28)**



[10] **Hook for shoulder strap (below)**

[11] **LANC ⓛ control jack**
Connect the LANC ⓛ connecting cable to a wired remote control unit such as an editing controller. In this case, set the COMMANDER mode to OFF in the menu system (p. 25).
ⓛ stands for Local Application Control Bus sytem. The ⓛ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.

[12] ⓔ (earphone) jack (p.15)

[13] **Hook for shoulder strap (below)**

[14] **Lithium battery compartment (p. 27)**

[15] **Cassette compartment lid (p. 9)**

[16] **MIC (microphone) jack**

[17] **VIDEO jack (p. 16)**

[18] **RFU DC OUT (RFU adaptor DC out) jack**

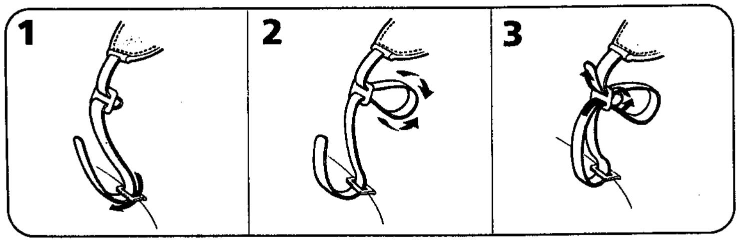
[19] **AUDIO jack (p. 16)**

[20] **Jack cover**

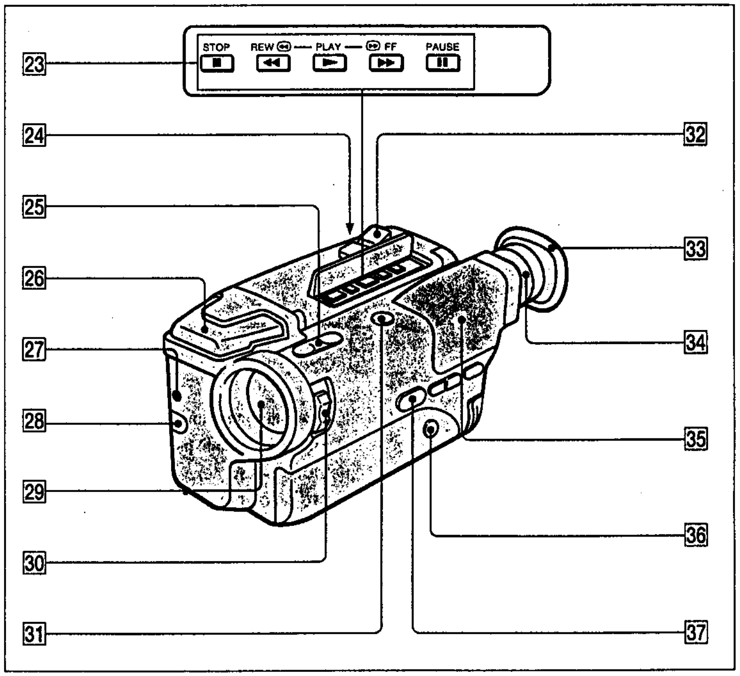
[21] **Grip strap (p. 14)**

[22] **Tripod receptacle (p. 14)**
Attach a tripod (not supplied) here.
When attaching a non-Sony tripod, make sure that the length of the camera mounting screw is shorter than 9/32 inches (6.5 mm).
Otherwise, the screw might damage the inner part of the camcorder.

Attaching the shoulder strap
Attach the supplied shoulder strap to the hooks for the shoulder strap ([10], [13]).



Identifying the Parts



[23] **Tape transport buttons (p. 17, 18)**
■ STOP
◀◀ REW (rewind)
▶ PLAY (playback)
▶▶ FF (fast forward)
❚❚ PAUSE
These buttons will function in PLAYER mode.

[24] **EJECT button (p. 9)**

[25] **EDITSEARCH button (p. 15)**

[26] **Built-in microphone**

[27] **Camera recording/battery lamp**

[28] **Remote sensor (p. 44)**

[29] **Lens cover**

[30] **POWER switch (p. 10, 11, 15, 17)**

[31] **FADER button (p. 23)**

[32] **POWER ZOOM button (p. 13)**

[33] **Eyecup (p. 14)**

[34] **Viewfinder adjustment ring (p. 10)**

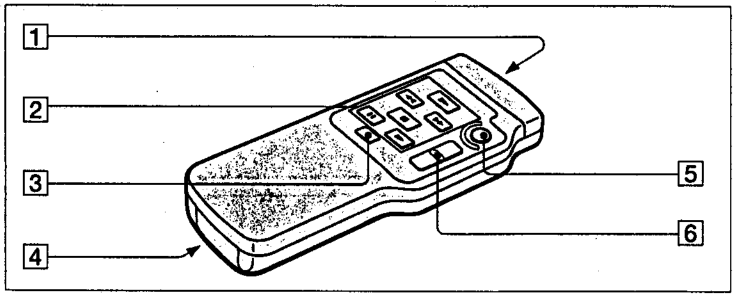
[35] **Viewfinder (p. 10, 14)**

[36] **BACK LIGHT button (p. 21)**

[37] **PROGRAM AE button (p. 22)**

Remote Commander

The buttons that have the same name on the Remote Commander and on the camcorder function identically.



1 **Transmitter (p. 17, 44)**
Point toward the remote sensor to control the camcorder after turning on the POWER switch on the camcorder.

2 **Tape transport buttons (p. 17, 18)**

3 **DISPLAY button (p. 18)**

4 **Size AA (R6) battery holder**

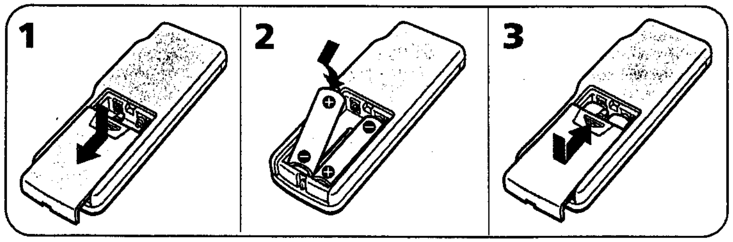
5 **START/STOP button**

6 **Power zoom button**
The zooming speed is unchangeable on the Remote Commander.

Preparing the Remote Commander

To use the Remote Commander, you must insert two size AA (R6) batteries. Use the supplied size AA (R6) batteries.

(1) Remove the battery cover from the Remote Commander. **(2)** Insert both of the size AA (R6) batteries with correct polarity. **(3)** Put the battery cover back onto the Remote Commander.

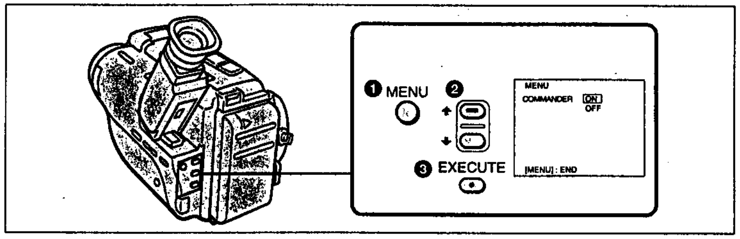


Note on battery life
The batteries for the Remote Commander last about 6 months under normal operation. When the batteries become weak or daed, the Remote Commander does not work.

To avoid damage from possible battery leakage
Remove the batteries when you will not use the Remote Commander for a long time.

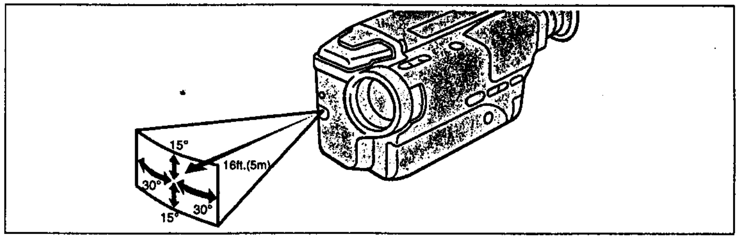
Using the Remote Commander

Make sure that the COMMANDER mode is set to ON in the menu system (p. 25).



Remote Control Direction

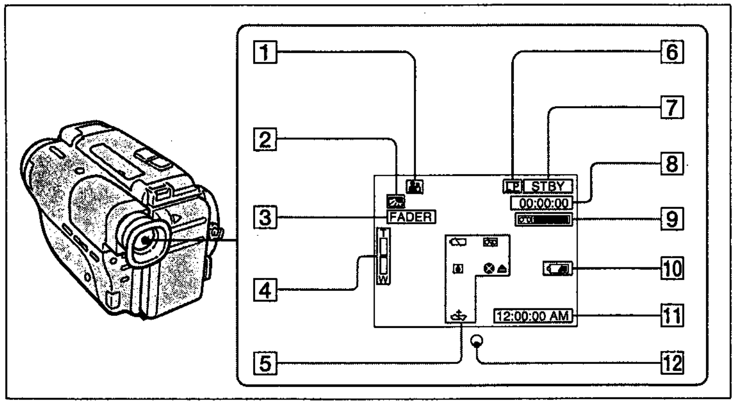
Aim the Remote Commander to the remote sensor within the range as shown below.



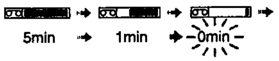
Notes on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- This camcorder works at commander mode VTR 2. The commander modes (1, 2, and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

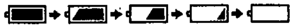
In the Viewfinder



1. PROGRAM AE mode indicator (p. 22)
2. Back light indicator (p. 21)
3. FADER indicator (p. 23)
4. Power zoom indicator (p. 13)
5. Warning indicator (p. 46)
6. Lights up when playing back a tape recorded in LP mode (p. 29)
7. Tape transport mode (p. 11)
8. Tape counter (p. 12)
9. Tape remaining indicator



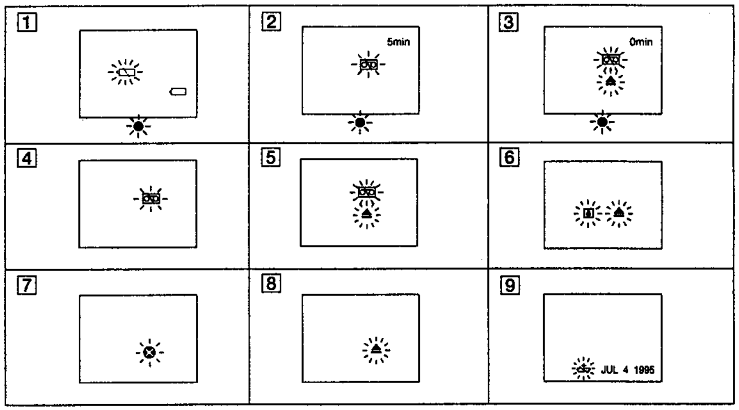
10. Battery remaining indicator (p. 30)



11. Date or Time (p. 20)
12. Recording lamp/Battery lamp (p. 11)

Warning Indicators

If indicators flash in the viewfinder, or a caution lamp on the camcorder flahses, check the following:



1. Battery Remaining
   Slow flashing: The battery is weak.
   Fast flashing: The battery is dead.
2. The tape is near the end.
3. The tape has run out.
4. No tape has been inserted.
5. The tab on the tape is out (red) (p.9).
6. Moisture condensation has occurred (p. 32).
7. The video heads may be contaminated (p. 33).
8. Some other trouble has occurred.
   Disconnect the power source and contact your Sony dealer or local authorized facility.
9. The lithium battery is weak or the lithium battery is not installed (p. 27).

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing. (The other layers'patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- ○: Through hole .

* Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted. Chip resistor are 1/10W or 1/16W unless otherwise noted. kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repeair.*
- —— : B+ Line.*
- - - - : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

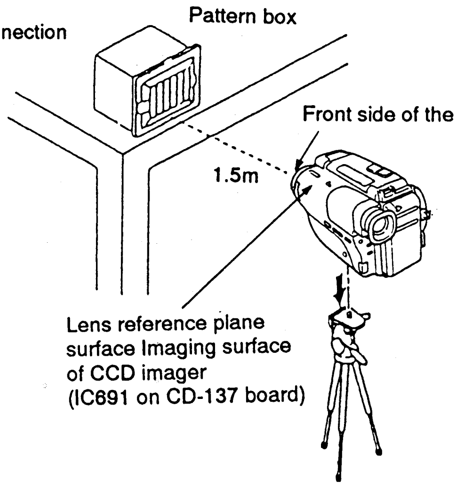
*: indicated by the color red.

- **Measuring conditions voltage value and waveform.**

(CAMERA REC mode)

- The object is color bar chart of pattern box.*
- Voltages are dc between ground and measurement points.* Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

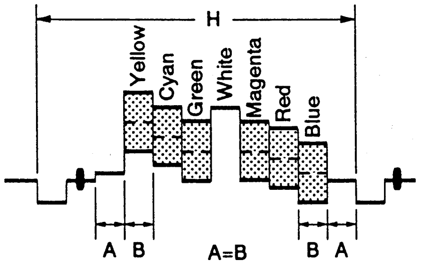


Fig. a (Video output terminal output waveform)

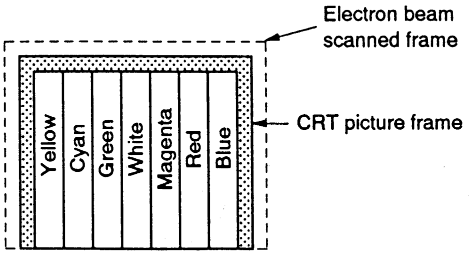


Fig. b (Picture on monitor TV)

(REC/PB mode)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

Note: Refer to "3-1-4. How to set the REC Mode" in VIDEO SECTION ADJUSTMENT. (See Page 6–36).

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▬ : Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- ○: Through hole.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W or 1/16W unless otherwise noted.
  kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ⊡ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.*
- ─── : B+ Line.*
- ╍╍╍ : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

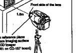
*: indicated by the color red.

- **Measuring conditions voltage value and waveform.**

(CAMERA REC mode)

- The object is color bar chart of pattern box.*
- Voltages are dc between ground and measurement points.*
  Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection


Pattern box
Front side of the lens
1.5m
Lens reference plane surface imaging surface of CCD imager (IC901 on CD-137 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

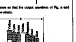


Fig. a (Video output terminal output waveform)

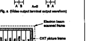


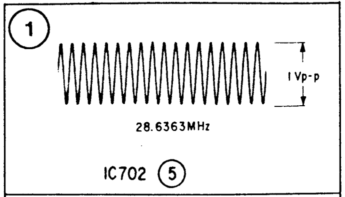
Fig. b (Picture on monitor TV)

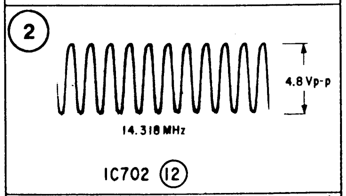
(REC/PB mode)

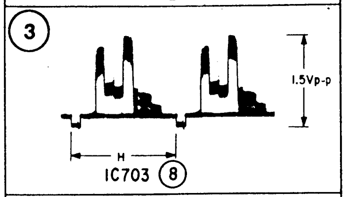
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

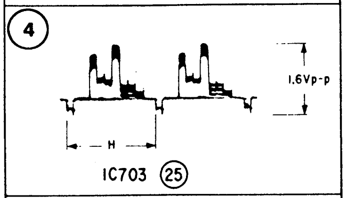
Note: Refer to "3-1-4. How to set the REC Mode" in VIDEO SECTION ADJUSTMENT. (See Page 6-36).

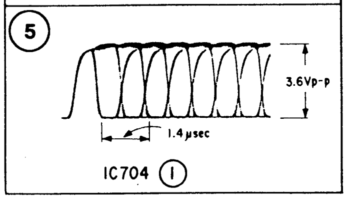
VC-160 BOARD (1/3)



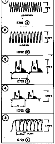






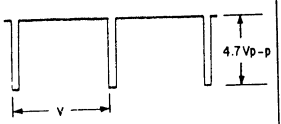


VC-100 BOARD (1/3)



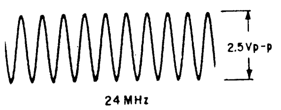
VC-160 BOARD(2/3)

⑥



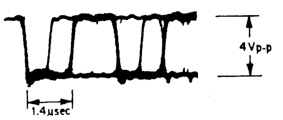
IC602 ③

⑦



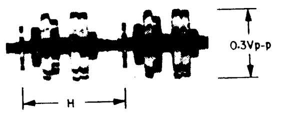
IC602 ㊿

⑧



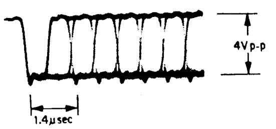
IC609 ⑬ ⑱

⑨



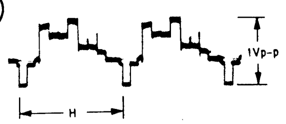
IC609 ㉗

⑩



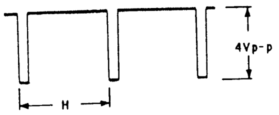
IC609 ㊳ ㊼

⑪



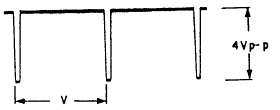
IC609 ㊾

⑫



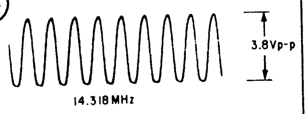
IC609 (69)

⑬



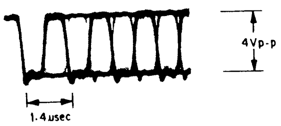
IC609 (70)

⑭



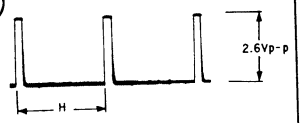
IC609 (78)

⑮



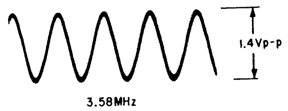
IC609 (96)

⑯



IC610 ⑭

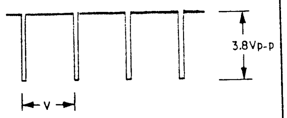
⑰



IC610 (54)

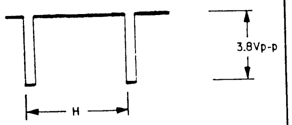
VC-160 BOARD(3/3)

⑱



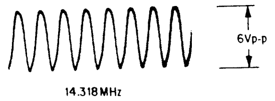
IC753 ①

⑲



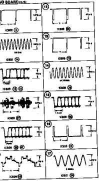
IC753 ②

⑳

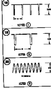


IC753 ⑧

VC-160 BOARD (2/3)



VC-160 BOARD (3/3)



VS-124 BOARD

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C109	H-6
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C111	H-22
C112	G-24
C113	G-24
C114	H-6
C115	H-22
C116	H-5
C117	H-6
C118	H-5
C119	H-23
C120	H-23
C121	G-23
C122	H-5
C123	G-5
C124	G-6
C128	G-23
C131	G-6
C134	F-6
C136	G-22
C137	F-4
C143	G-22
C144	G-22
C145	H-6
C146	H-6
C147	G-4
C148	G-4
C149	G-5
C150	F-6
C151	F-23
C152	F-22
C154	F-5
C157	F-4
C158	F-22
C159	F-5
C160	F-5
C161	E-4
C163	F-22
C164	F-5
C165	G-6
C166	E-4
C167	F-6
C168	E-5
C169	G-6
C172	E-23
C179	G-23
C190	G-22
C204	G-11
C205	H-16
C206	G-17
C207	F-10
C208	G-13
C209	G-11
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C220	G-10
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C225	H-10
C226	H-11
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C230	F-18
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C508	B-3
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C516	A-2
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C519	H-2
C521	I-2
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C545	B-6
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C570	C-22
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C959	F-13
C967	F-12
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CN202	E-13
CN203	F-25
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CN502	A-25
CN503	A-24
CN504	E-1
CN505	I-25
D101	F-22
D102	G-22
D201	F-10
D204	F-10
D212	G-15
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D321	G-13
D501	D-26
D504	C-2
D505	C-25
FL201	F-9
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IC205	I-12
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IC502	D-26
IC503	B-26
IC505	B-5
IC506	H-3
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IC951	G-7
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L104	H-24
L105	I-6
L108	G-5
L109	F-4
L110	F-23
L111	F-6
L112	F-4
L113	F-6
L114	F-4
L115	G-6
L116	F-4
L118	F-22
L120	F-22
L203	H-10
L204	H-9
L207	H-20
L209	H-20
L213	G-8
L214	I-8
L503	C-22
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PS501	D-27
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Q102	H-4
Q103	H-24
Q104	G-24
Q105	G-22
Q106	F-21
Q109	G-4
Q111	F-6
Q112	F-23
Q113	F-5
Q114	F-4
Q115	G-6
Q117	E-6
Q119	F-6
Q126	H-5
Q129	F-23
Q132	G-23
Q133	G-5
Q134	H-23
Q135	G-5
Q202	F-17
Q204	G-12
Q216	I-16
Q217	I-15
Q219	F-21
Q225	F-20
Q232	G-20
Q234	H-8
Q235	F-8
Q236	G-19
Q237	F-19
Q238	H-8
Q240	H-8
Q242	H-9
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Q252	G-16
Q253	E-11
Q254	H-15
Q256	H-9
Q257	I-9
Q258	G-10
Q259	G-18
Q260	G-20
Q261	H-16
Q262	H-16
Q263	I-11
Q264	H-16
Q266	H-19
Q267	G-10
Q268	G-16
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Q952	E-2
Q953	G-13
Q954	F-12
Q955	G-13
Q956	E-12
Q957	H-14
Q958	F-13
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R102	G-24
R103	G-24
R104	H-6
R105	H-6
R106	H-24
R107	H-24
R108	H-4
R109	H-4
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R120	G-5
R122	G-22
R123	G-22
R124	F-23
R126	F-4
R127	F-4
R128	G-4
R130	F-23
R132	F-23
R133	F-4
R134	F-23
R135	F-23
R136	G-5
R137	F-6
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R141	F-22
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R159	E-5
R160	G-6
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R163	E-5
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R165	F-6
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R173	F-5
R174	G-4
R175	E-5
R178	G-3
R179	H-4
R180	G-7
R181	G-7
R185	G-22
R186	G-24
R187	G-24
R188	F-23
R189	F-23
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R195	G-5
R196	G-6
R197	G-15
R199	A-22
R201	G-19
R202	G-9
R203	G-10
R204	G-11
R205	G-12
R207	G-12
R209	F-17
R210	F-11
R211	G-12
R212	F-19
R213	F-10
R214	F-11
R215	G-12
R216	G-18
R218	G-12
R219	F-10
R220	G-12
R221	H-16
R222	G-12
R223	H-16
R224	G-20
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R228	G-15
R229	H-16
R230	H-11
R231	F-11
R232	F-11
R233	G-16
R234	G-16
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R241	I-16
R245	I-15
R246	E-21
R247	E-21
R253	G-10
R255	G-18
R256	G-18
R259	G-19
R261	G-19
R263	G-9
R265	G-19
R272	F-10
R273	F-10
R274	G-21
R279	G-21
R283	H-10
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R295	F-8
R296	H-9
R297	G-20
R300	G-20
R302	H-9
R303	H-20
R304	H-9
R305	H-20
R307	H-19
R308	F-9
R309	F-8
R311	I-18
R312	F-8
R313	F-8
R314	H-19
R315	F-8
R316	H-19
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R323	F-8
R324	F-19
R325	F-19
R328	I-20
R331	G-9
R332	H-15
R333	F-18
R334	I-20
R338	I-8
R339	G-10
R342	H-9
R347	H-10
R348	H-8
R349	I-9
R354	H-9
R357	G-9
R364	F-19
R366	F-21
R368	G-10
R373	F-10
R383	G-10
R387	G-17
R395	E-10
R398	I-10
R399	I-10
R500	B-2
R501	C-2
R502	B-6
R503	A-6
R505	B-1
R506	B-1
R507	A-4
R508	C-25
R509	B-3
R510	B-3
R511	A-7
R512	A-6
R513	B-23
R514	A-23
R515	C-2
R516	C-23
R517	B-3
R518	C-22
R519	C-3
R520	B-3
R522	F-2
R523	G-2
R525	C-22
R526	C-22
R527	B-24
R528	H-2
R529	H-2
R530	I-2
R531	C-3
R532	B-3
R533	G-25
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R538	B-4
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R540	B-22
R541	C-6
R542	B-24
R543	G-2
R544	C-24
R546	G-1
R548	A-4
R549	C-23
R552	A-6
R553	A-5
R555	G-26
R556	C-23
R558	A-7
R560	I-3
R561	C-6
R562	C-6
R563	B-6
R565	G-26
R566	B-24
R567	A-2
R569	B-23
R570	C-22
R572	C-6
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R577	E-3
R578	B-3
R579	C-3
R580	C-2
R581	C-2
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R583	C-2
R584	A-7
R585	C-24
R586	A-3
R587	A-2
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R590	B-23
R591	G-26
R592	C-3
R593	C-25
R594	D-26
R595	C-26
R596	A-3
R597	H-25
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R952	H-13
R954	E-2
R955	E-2
R956	E-2
R957	E-1
R960	E-12
R962	F-13
R963	F-13
R964	G-13
R965	G-13
R966	E-16
R967	F-15
R968	G-14
R969	H-14
R970	G-14
R988	G-14
R989	F-13
R990	F-12
R991	E-12
R992	E-12
R993	F-13
R994	F-12
R995	F-13
R996	F-13
R1400	C-6
R1401	A-23
R1403	B-1
R1404	A-3
R1406	A-5
R1408	A-3
R1412	D-3
R1413	B-2
R1414	A-5
R1415	A-5
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RB501	B-2
RB502	A-1
RB503	A-1
RB504	D-26
RB505	B-24
RB506	B-22
RB510	A-4
RB512	B-27
RB513	B-1
RB515	B-2
RB516	B-2
RB518	C-25
RB519	C-2
RB520	A-2
RB523	A-4
RB524	C-3
RB525	C-4
RB526	C-4
RB527	F-3
RB528	G-3
RB529	A-6
RB530	B-7
RB531	E-2
RB532	E-3
RB535	C-4
RB536	B-6
RB537	B-24
RB542	B-6
RB543	A-5
RB544	A-4
RB549	C-25
RB550	A-5
RB552	C-23
RB554	C-26
RV202	F-9
X201	H-17
X501	B-4
X502	D-5
XTL501	A-3

VR-124 BOARD

C101	H-22
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C103	H-4
C107	G-24
C108	H-24
C109	H-5
C110	H-5
C111	H-22
C112	G-24
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C114	H-5
C115	H-22
C116	H-5
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C118	H-5
C119	H-23
C120	H-23
C121	G-23
C122	H-5
C123	G-5
C124	G-5
C125	G-23
C131	G-5
C134	F-5
C135	G-22
C137	F-4
C143	G-22
C144	G-22
C145	H-5
C146	H-5
C147	G-4
C148	G-4
C149	G-5
C150	F-5
C151	F-23
C152	F-22
C154	F-5
C157	F-4
C158	F-22
C159	F-5
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C161	F-4
C163	F-22
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C165	G-5
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C167	F-5
C168	G-5
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C180	G-22
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C210	H-11
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C289	G-19
C290	H-9
C291	H-10
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C301	H-11
C305	I-9
C307	H-11
C310	F-19
C312	G-19
C313	F-19
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C516	A-2
C518	F-2
C519	H-3
C521	I-2
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C523	H-25
C524	B-28
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C527	B-3
C528	D-2
C529	D-2
C530	C-2
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C547	D-2
C548	C-3
C550	I-3
C556	F-2
C560	F-2
C561	D-4
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C563	B-25
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C586	G-13
C588	G-14
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C597	F-12
CN101	I-22
CN102	H-14
CN201	G-14
CN202	E-13
CN203	F-25
CN206	A-22
CN502	A-25
CN503	A-24
CN504	E-1
CN505	I-25
D101	F-22
D102	F-22
D201	F-10
D204	F-10
D212	G-15
D213	F-11
D321	G-13
D501	D-28
D504	C-2
D505	C-25
FL201	F-8
IC102	H-22
IC201	G-17
IC203	F-20
IC205	I-12
IC501	B-1
IC502	C-28
IC503	B-28
IC505	B-5
IC506	H-3
IC508	B-28
IC851	G-7
IC855	F-14
L103	I-5
L104	H-24
L105	I-5
L106	G-5
L109	F-4
L110	F-23
L111	F-5
L112	F-4
L113	F-5
L114	F-4
L115	G-5
L116	F-4
L118	F-22
L120	F-22
L205	H-10
L206	H-9
L207	H-20
L209	H-20
L213	G-9
L214	I-8
L503	C-23
PB500	H-25
PB501	D-27
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Q102	H-4
Q103	H-24
Q104	G-24
Q105	G-22
Q106	F-21
Q108	G-4
Q111	F-5
Q112	F-23
Q113	F-5
Q114	F-4
Q115	G-6
Q117	G-5
Q118	F-5
Q126	H-5
Q128	F-23
Q132	G-23
Q133	G-5
Q134	H-23
Q135	G-5
Q203	F-17
Q204	G-12
Q216	I-10
Q217	I-15
Q218	F-21
Q226	F-20
Q232	G-20
Q234	H-8
Q235	I-8
Q236	G-19
Q237	F-19
Q239	H-8
Q240	H-9
Q242	H-9
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Q252	G-18
Q253	E-11
Q254	H-15
Q256	H-9
Q257	I-9
Q258	G-10
Q259	G-18
Q260	G-20
Q261	H-16
Q262	H-18
Q263	I-11
Q264	H-18
Q266	H-18
Q267	G-18
Q268	G-18
Q501	F-2
Q503	F-5
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Q505	C-3
Q507	C-22
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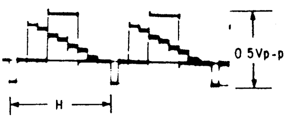
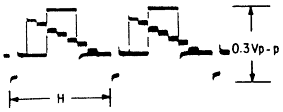
Q551	E-5
Q552	E-5
Q553	G-13
Q554	F-12
Q555	G-13
Q556	E-12
Q557	H-14
Q558	F-13
R101	H-23
R102	G-24
R103	G-24
R104	H-5
R105	H-5
R106	H-24
R107	H-24
R108	H-4
R109	H-4
R110	H-24
R111	H-5
R112	G-23
R114	G-23
R116	G-23
R118	G-22
R120	G-5
R122	G-22
R123	G-22
R124	F-23
R125	F-4
R127	F-4
R128	G-4
R130	F-23
R132	F-23
R133	F-4
R134	F-23
R135	F-23
R136	G-5
R137	F-5
R140	F-4
R141	F-22
R142	F-5
R143	F-22
R144	F-4
R146	F-5
R147	F-22
R148	G-5
R149	F-5
R150	H-4
R151	F-5
R152	F-5
R153	G-5
R154	E-5
R156	E-5
R159	F-5
R160	G-5
R162	F-5
R163	E-5
R164	F-22
R165	F-5
R166	E-4
R171	E-23
R173	F-5
R174	G-4
R175	E-5
R176	G-3
R179	H-4
R180	G-7
R181	G-7
R184	G-22
R185	G-24
R187	G-24
R188	F-23
R189	F-23
R193	G-5
R194	G-5
R195	G-5
R196	G-5
R197	G-15
R199	A-22
R201	G-18
R202	G-9
R203	G-10
R204	G-11
R206	G-12
R207	G-12
R209	F-17
R210	F-11
R211	G-12
R212	F-19
R213	F-10
R214	F-11
R215	G-12
R216	G-15
R218	G-17
R219	F-10
R220	G-12
R221	H-15
R222	G-12
R223	H-15
R224	G-20
R226	H-11
R228	G-15
R229	H-15
R230	H-11
R231	F-11
R232	F-11
R233	G-15
R234	G-15
R235	H-17
R236	G-16
R241	I-16
R243	I-15
R246	E-21
R247	E-21
R253	G-10
R255	G-15
R256	G-15
R258	G-19
R261	G-19
R263	G-9
R265	G-10
R272	F-10
R273	F-10
R274	G-21
R279	G-21
R283	H-10
R285	F-18
R286	I-20
R288	F-20
R289	F-20
R290	F-9
R291	H-5
R293	F-9
R296	H-9
R297	G-20
R300	G-20
R302	H-9
R303	H-20
R304	H-9
R306	H-20
R307	H-19
R308	F-9
R309	F-9
R311	I-18
R312	F-9
R313	F-9
R314	H-19
R315	F-9
R316	H-19
R317	G-19
R318	G-9
R319	H-19
R321	H-19
R322	F-19
R323	F-9
R324	F-19
R325	F-19
R329	I-20
R331	G-9
R332	H-15
R333	F-18
R334	I-20
R335	I-8
R336	G-10
R342	H-9
R347	H-10
R348	H-9
R349	I-9
R354	H-9
R357	G-9
R364	F-18
R366	F-21
R368	G-10
R372	F-10
R383	G-10
R387	G-17
R389	E-10
R395	I-10
R399	I-10
R500	B-2
R501	C-2
R502	B-5
R503	A-5
R505	B-1
R506	B-1
R507	A-4
R508	C-25
R509	B-3
R510	B-3
R511	A-7
R512	A-5
R513	B-23
R514	A-23
R515	C-2
R516	C-25
R517	D-2
R518	C-22
R519	D-3
R520	B-3
R522	F-2
R523	G-2
R525	C-22
R526	D-22
R527	B-24
R528	B-2
R529	B-2
R530	I-2
R531	C-3
R532	B-3
R533	B-26
R534	C-25
R535	C-25
R536	C-26
R537	C-22
R538	B-4
R539	C-22
R540	B-22
R541	C-5
R542	B-24
R543	B-2
R544	C-24
R545	C-1
R546	A-4
R549	C-23
R550	A-5
R551	A-5
R555	B-26
R556	C-23
R558	A-7
R560	I-3
R561	C-5
R562	C-5
R563	B-5
R565	G-26
R566	B-24
R567	A-2
R569	B-23
R570	C-22
R572	C-5
R573	E-2
R577	E-3
R578	B-3
R579	C-3
R580	C-2
R581	C-2
R582	B-5
R583	C-2
R584	A-7
R585	C-24
R586	A-3
R587	A-2
R588	H-25
R589	A-22
R590	B-23
R591	G-25
R592	G-2
R593	D-25
R594	D-26
R595	D-26
R596	A-5
R597	H-26
R599	A-5
R601	H-21
R602	H-19
R604	E-2
R605	E-2
R606	E-2
R607	E-1
R650	E-12
R652	F-13
R653	F-13
R654	G-13
R655	E-13
R656	E-15
R657	F-15
R658	G-14
R659	H-14
R670	G-14
R680	G-14
R690	F-12
R695	F-12
R681	E-12
R682	E-12
R683	F-13
R684	F-12
R685	F-13
R686	F-13
R1400	D-5
R1401	A-23
R1403	B-1
R1404	A-3
R1406	A-5
R1408	A-3
R1412	D-3
R1413	B-2
R1414	A-5
R1415	A-5
RB100	B-22
RB501	B-2
RB502	A-1
RB503	A-1
RB504	D-25
RB505	E-24
RB506	E-22
RB510	A-4
RB512	B-27
RB513	B-1
RB515	B-2
RB516	B-2
RB518	C-25
RB519	C-2
RB520	A-2
RB523	A-4
RB524	C-3
RB525	C-4
RB526	C-4
RB527	F-3
RB528	G-3
RB529	A-5
RB530	B-7
RB531	E-2
RB532	E-3
RB535	C-4
RB536	B-5
RB537	B-24
RB542	B-5
RB543	A-5
RB544	A-5
RB549	C-25
RB551	A-5
RB552	C-23
RB554	C-25
RV202	F-9
X201	H-17
X501	E-4
X502	C-5
XTL501	A-3

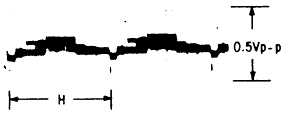
VS-124 BOARD (2/5)

⑤


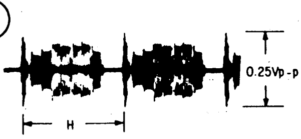
IC201 ⑤ REC

⑥


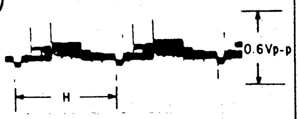
IC201 ⑤ PB

⑦


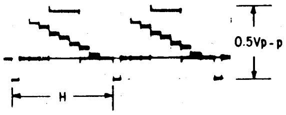
IC201 ⑦ PB

⑧


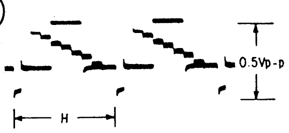
IC201 ⑧ REC

⑨


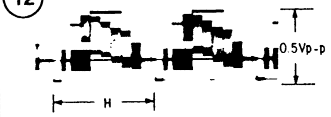
IC201 ⑩ PB

⑩


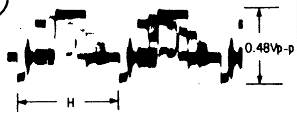
IC201 ⑭ REC

⑪


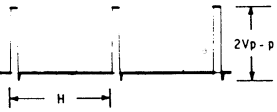
IC201 ⑭ PB

⑫


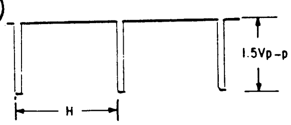
IC201 ㉑ ㉓ REC

⑬


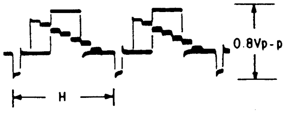
IC201 ㉑ ㉓ PB

⑭


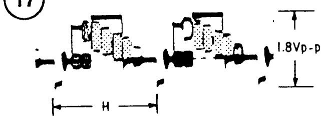
IC201 ㉔ REC/PB

⑮


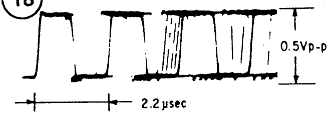
IC201 (62) REC/PB

⑯


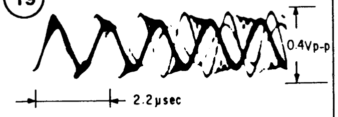
IC201 ㉜ PB

⑰


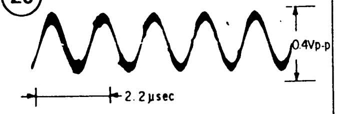
IC201 ㊱ PB

⑱


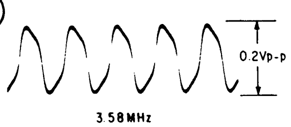
IC201 ㊴ REC

⑲


IC201 ㊶ PB

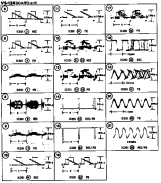
⑳


IC201 ㊺ PB

㉑


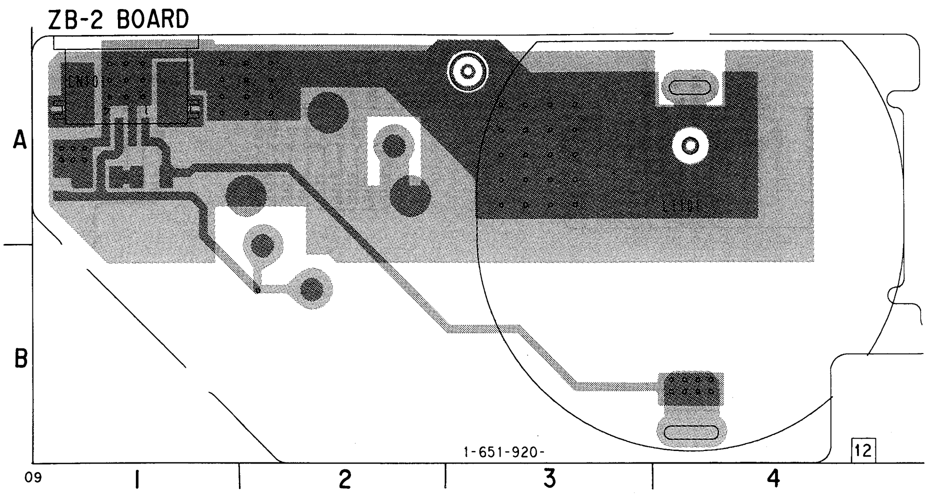
IC201 (59) REC/PB

VS-124 BOARD (2/5)



ZB-2 (LITHIUM BATTERY) PRINTED WIRING BOARD

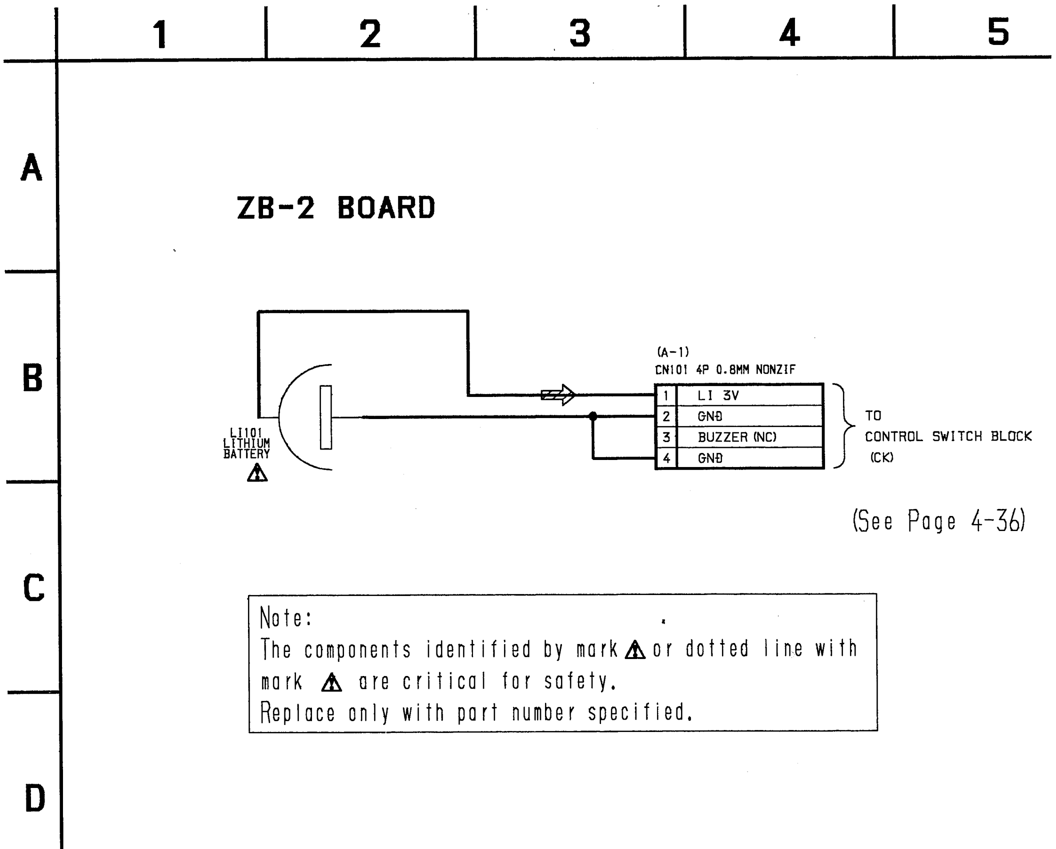
— Ref. No. ZB-2 BOARD: 3,000 series —


ZB-2 BOARD
CN101
LI101
A
B
1-651-920-
12
09
1
2
3
4

- **For printed wiring board of ZB-2 board.**
- ▨ : Pattern from the side which enable seeing.
- ░ : Pattern of the rear side.

ZB-2 (LITHIUM BATTERY) SCHEMATIC DIAGRAM

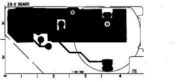
— Ref. No. ZB-2 BOARD: 3,000 series —


1
2
3
4
5
A
B
C
D
ZB-2 BOARD
(A-1)
CN101 4P 0.8MM NONZIF
1 LI 3V
2 GND
3 BUZZER (NC)
4 GND
TO
CONTROL SWITCH BLOCK
(CK)
LI101
LITHIUM
BATTERY
⚠
(See Page 4-36)
09

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

ZB-2 (LITHIUM BATTERY) PRINTED WIRING BOARD

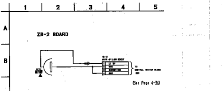
— Ref. No. ZB-2 BOARD: 3,000 series —


ZB-2 BOARD
A
B
1
2
3
4
1-661-500-

ZB-2 (LITHIUM BATTERY) SCHEMATIC DIAGRAM

— Ref. No. ZB-2 BOARD: 3,000 series —

- For printed wiring board of ZB-2 board.
- ■ : Pattern from the side which enable seeing.
- ■ : Pattern of the rear side.

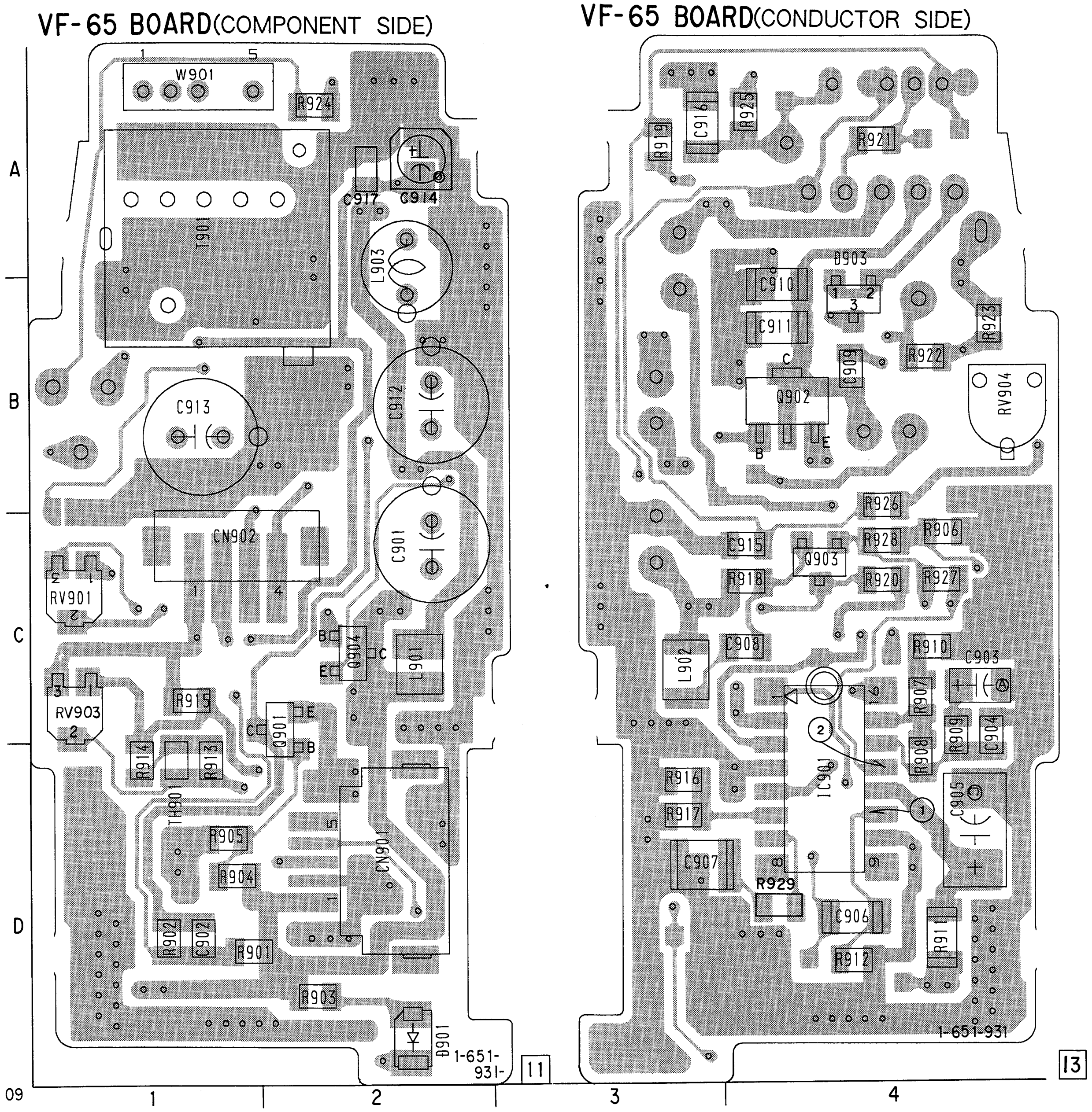

1
2
3
4
5
A
B
C
D
ZB-2 BOARD
LI 3V
GND
BACKUP
GND
TO CONTROL SWITCH BLOCK
See Page 4-39

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

VF-65 (W/B EVF) PRINTED WIRING BOARD (CCD-TR23/TR380)

— Ref. No. VF-65 BOARD: 4,000 series —

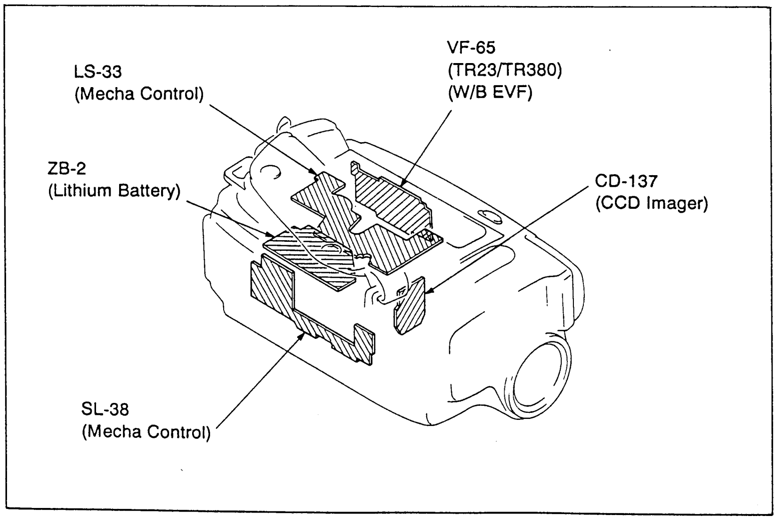
VF-65	BOARD
C901	C-2
C902	D-1
C903	C-4
C904	C-4
C905	D-4
C906	D-4
C907	D-3
C908	C-4
C909	B-4
C910	B-4
C911	B-4
C912	B-2
C913	B-1
C914	A-2
C915	C-4
C916	A-3
C917	A-2
CN901	D-2
CN902	C-1
D901	D-2
D903	B-4
IC901	D-4
L901	C-2
L902	C-3
L903	A-2
Q901	C-2
Q902	B-4
Q903	C-4
Q904	C-2
R901	D-1
R902	D-1
R903	D-2
R904	D-1
R905	D-1
R906	C-4
R907	C-4
R908	D-4
R909	C-4
R910	C-4
R911	D-4
R912	D-4
R913	D-1
R914	D-1
R915	C-1
R916	D-3
R917	D-3
R918	C-4
R919	A-3
R920	C-4
R921	A-4
R922	B-4
R923	B-4
R924	A-2
R925	A-4
R926	B-4
R927	C-4
R928	C-4
R929	D-4
RV903	C-1
RV904	B-4
T901	A-1
TH901	D-1
W901	A-1


VF-65 BOARD(COMPONENT SIDE)

VF-65 BOARD(CONDUCTOR SIDE)

A
B
C
D
09
1
2
3
4
W901
1
5
R924
T901
C917
C914
L903
C913
C912
C901
CN902
RV901
RV903
R915
Q904
L901
Q901
R914
R913
TH901
R905
R904
CN901
R902
C902
R901
R903
D901
1-651-931
11
R919
C916
R925
R921
D903
C910
C911
C909
R922
R923
Q902
RV904
R926
C915
R928
R906
Q903
R918
R920
R927
L902
C908
R910
C903
R907
R909
C904
R908
IC901
R916
R917
C905
C907
R929
C906
R912
R911
1-651-931
13

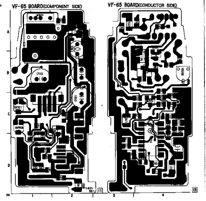
- **For printed wiring boards.**
- VF-65 board is a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.


LS-33
(Mecha Control)
VF-65
(TR23/TR380)
(W/B EVF)
ZB-2
(Lithium Battery)
CD-137
(CCD Imager)
SL-38
(Mecha Control)

VF-65 (W/B EVF) PRINTED WIRING BOARD (CCD-TR23/TR380)

— Ref. No. VF-65 BOARD: 4,000 series —

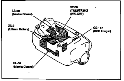
VF-65	BOARD
C901	C-3
C902	D-1
C903	C-4
C904	C-4
C905	C-4
C906	C-4
C907	D-3
C908	C-4
C909	B-4
C910	B-4
C911	B-4
C912	B-2
C913	D-1
C914	A-2
C915	C-4
C916	A-3
C917	A-2
CN901	C-2
CN902	C-1
D901	D-2
D903	B-4
IC901	C-4
L901	C-2
L902	C-3
L903	A-2
Q901	C-2
Q902	B-4
Q903	C-4
Q904	C-2
R901	D-1
R902	D-1
R903	D-2
R904	D-1
R905	D-1
R906	C-4
R907	C-4
R908	D-4
R909	D-4
R910	C-4
R911	D-4
R912	D-4
R913	D-1
R914	D-1
R915	C-1
R916	D-3
R917	D-3
R918	C-4
R919	A-2
R920	C-4
R921	A-4
R922	B-4
R923	B-4
R924	A-2
R925	A-4
R926	D-4
R927	C-4
R928	C-4
R929	D-4
RV903	C-1
RV904	B-4
T901	A-1
TH901	D-1
W901	A-1


VF-65 BOARD(COMPONENT SIDE)

VF-65 BOARD(CONDUCTOR SIDE)

A
B
C
D
1
2
3
4
S901
RV901
RV903
IC901
1-651-
931-
11
13

- **For printed wiring boards.**
- VF-65 board is a four-layer printed board. However, the patterns of layers 2 to 3 have not been included in the diagram.


LS-33
(Mecha Control)
VF-65
(TR23/TR380)
(W/B EVF)
ZS-2
(Lithium Battery)
CD-157
(CCD Imager)
SL-58
(Mecha Control)

DD-77 BOARD

C901	A-11
C902	A-11
C903	A-11
C904	A-11
C906	B-2
C907	C-12
C908	C-3
C909	C-3
C910	B-11
C911	C-12
C912	F-6
C913	D-3
C914	D-3
C915	C-10
C917	C-10
C918	D-11
C920	C-9
C921	D-9
C923	D-9
C924	E-9
C925	B-5
C926	B-4
C927	D-9
C928	E-10
C929	B-9
C930	B-5
C931	D-6
C932	E-6
C934	C-6
C936	C-6
C938	C-6
C939	B-4
C940	B-4
C941	B-4
C942	A-3
C943	B-3
C944	B-3
C945	F-5
C946	B-2
C950	B-6
CN901	D-7
D901	B-10
D909	D-9
D910	B-12
F450	F-5
F451	F-5
F452	F-6
IC901	B-3
J901	H-10
J902	A-13
J903	B-13
L901	D-3
L902	C-3
L903	E-3
L904	C-5
L905	D-5
L906	D-4
L907	D-4
L908	D-5
L909	E-9
L910	D-9
L912	D-8
L914	B-10
L915	B-9
L916	D-9
L917	C-9
L918	B-2
L919	B-12
Q900	B-9
Q901	B-9
Q902	C-11
Q903	C-10
Q904	D-10
Q905	D-10
Q906	D-11
Q907	E-11
Q908	B-10
Q909	C-9
Q910	B-9
Q914	C-8
Q915	B-5
R901	B-11
R902	B-2
R903	B-4
R904	B-2
R905	B-2
R906	B-4
R907	B-3
R908	B-4
R909	C-12
R910	C-3
R911	C-3
R912	B-11
R913	B-12
R916	D-6
R917	E-8
R918	B-9
R919	B-4
R920	B-4
R922	C-9
R924	A-12
R925	C-12
R927	B-11
R928	B-12
R932	B-2
R936	B-2
R937	B-8
R938	B-5
R939	A-4
R940	A-4
R941	B-11
R943	C-9
R944	C-9
R945	B-12
R946	B-9
R947	B-10
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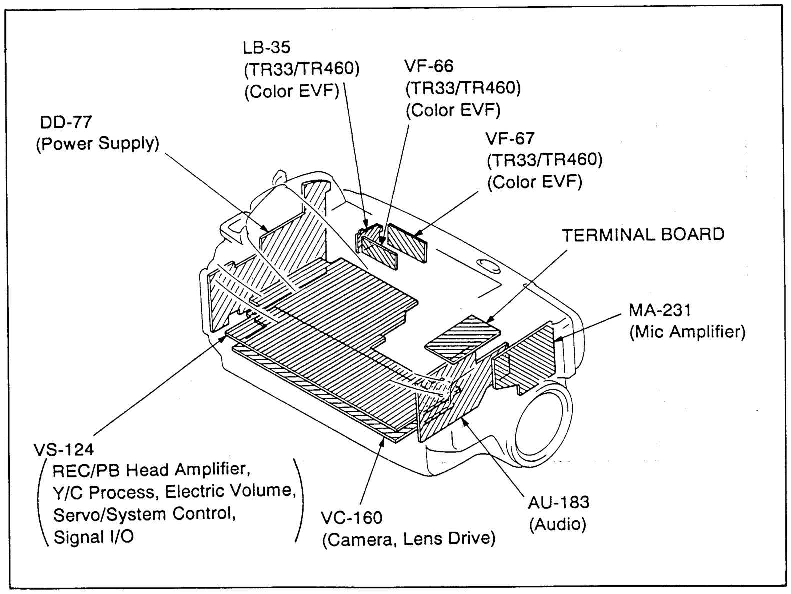
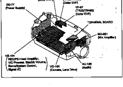
R949	B-10
T901	C-4

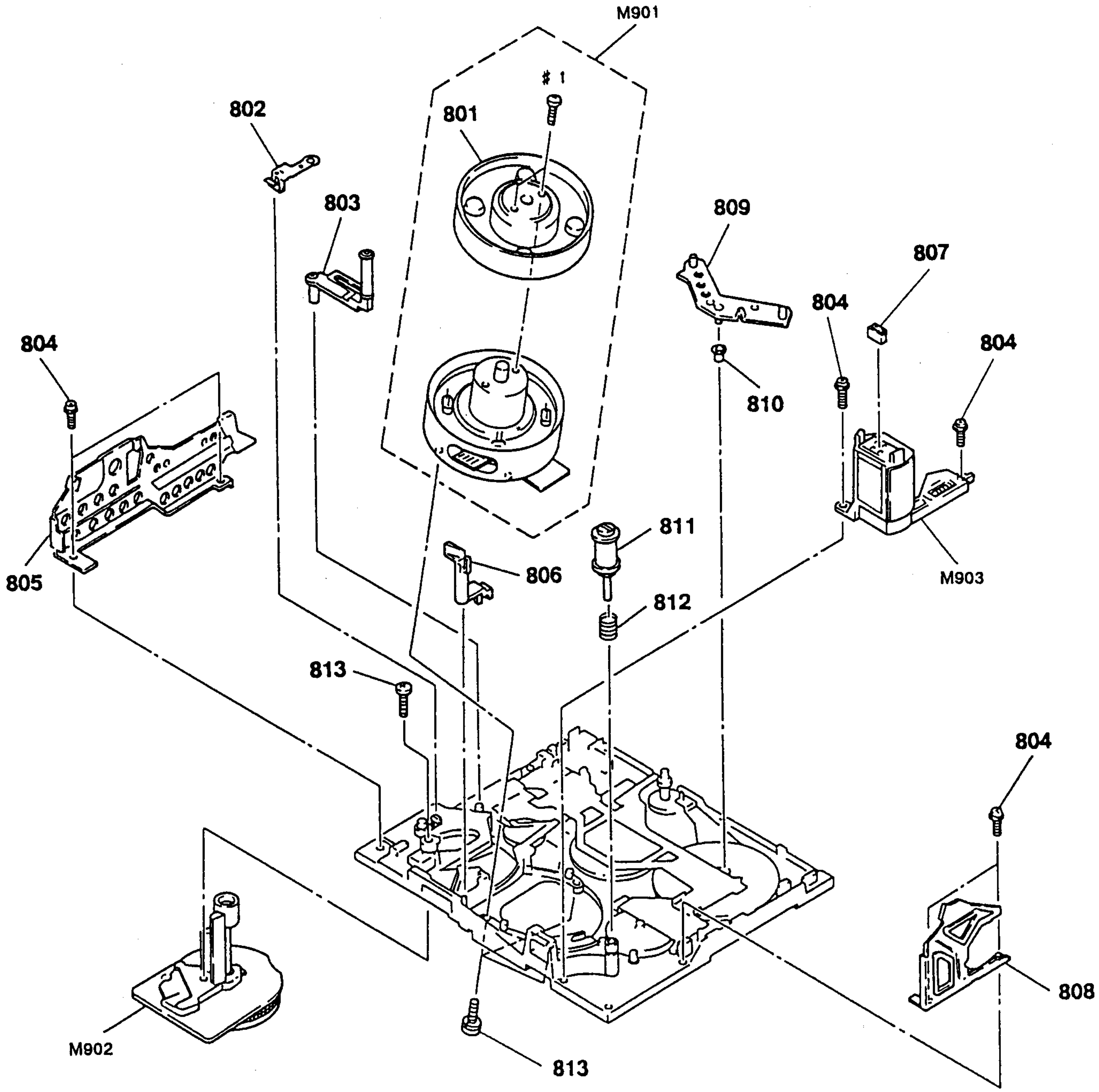

LB-35
(TR33/TR460)
(Color EVF)
VF-66
(TR33/TR460)
(Color EVF)
DD-77
(Power Supply)
VF-67
(TR33/TR460)
(Color EVF)
TERMINAL BOARD
MA-231
(Mic Amplifier)
VS-124
REC/PB Head Amplifier,
Y/C Process, Electric Volume,
Servo/System Control,
Signal I/O
VC-160
(Camera, Lens Drive)
AU-183
(Audio)

DD-77 BOARD

C801	A-11
C802	A-11
C803	A-11
C804	A-11
C806	B-2
C807	C-12
C808	C-3
C809	C-3
C810	B-11
C811	C-12
C812	F-8
C813	D-3
C814	D-5
C815	D-10
C817	D-10
C818	D-11
C820	D-8
C821	D-8
C823	D-8
C824	E-8
C825	B-5
C826	B-4
C827	D-8
C828	B-10
C829	B-9
C830	E-6
C831	C-8
C832	E-8
C834	C-8
C835	C-8
C836	C-8
C839	B-4
C840	B-4
C841	B-4
C842	A-5
C843	B-3
C844	B-2
C845	F-5
C846	B-2
C853	B-6
CN801	D-7
D801	B-12
D806	D-9
D810	B-12
F480	F-5
F481	F-5
F482	F-6
IC801	B-3
J801	H-10
J802	A-13
J803	B-13
L801	C-3
L802	C-3
L803	E-5
L804	C-5
L805	D-5
L806	D-4
L807	D-4
L808	D-8
L809	E-8
L810	D-8
L812	D-8
L814	B-10
L815	B-9
L816	D-9
L817	C-9
L818	B-2
L819	B-12
Q800	B-8
Q801	B-8
Q802	C-11
Q803	D-10
Q804	D-10
Q805	D-10
Q806	D-11
Q807	E-11
Q808	B-10
Q809	C-9
Q810	B-2
Q814	C-8
Q815	B-8
R801	B-11
R802	B-2
R803	B-4
R804	B-2
R805	B-2
R806	B-4
R807	B-3
R808	B-4
R809	C-12
R810	C-3
R811	C-3
R812	B-11
R813	B-12
R816	C-5
R817	C-6
R818	B-9
R819	D-4
R820	B-4
R822	C-8
R824	A-12
R826	C-12
R827	B-11
R828	B-12
R832	D-2
R836	B-2
R837	B-8
R838	B-5
R839	A-4
R840	A-4
R841	B-11
R843	C-8
R844	C-8
R845	B-12
R846	B-8
R847	B-10
R848	B-10
R849	B-10
T801	C-4


LB-35
(TR33/TR460)
(Color EVF)
VF-66
(TR33/TR460)
(Color EVF)
DD-77
(Power Supply)
VF-67
(TR33/TR460)
(Color EVF)
TERMINAL BOARD
MA-231
(Mic Amplifier)
VS-124
(REC/PB Head Amplifier, Y/C Process, Electric Volume, Servo/System Control, Signal I/O)
VC-160
(Camera, Lens Drive)
AU-182
(Audio)

5-1-10. MECHANISM CHASSIS ASSEMBLY (1)


M901
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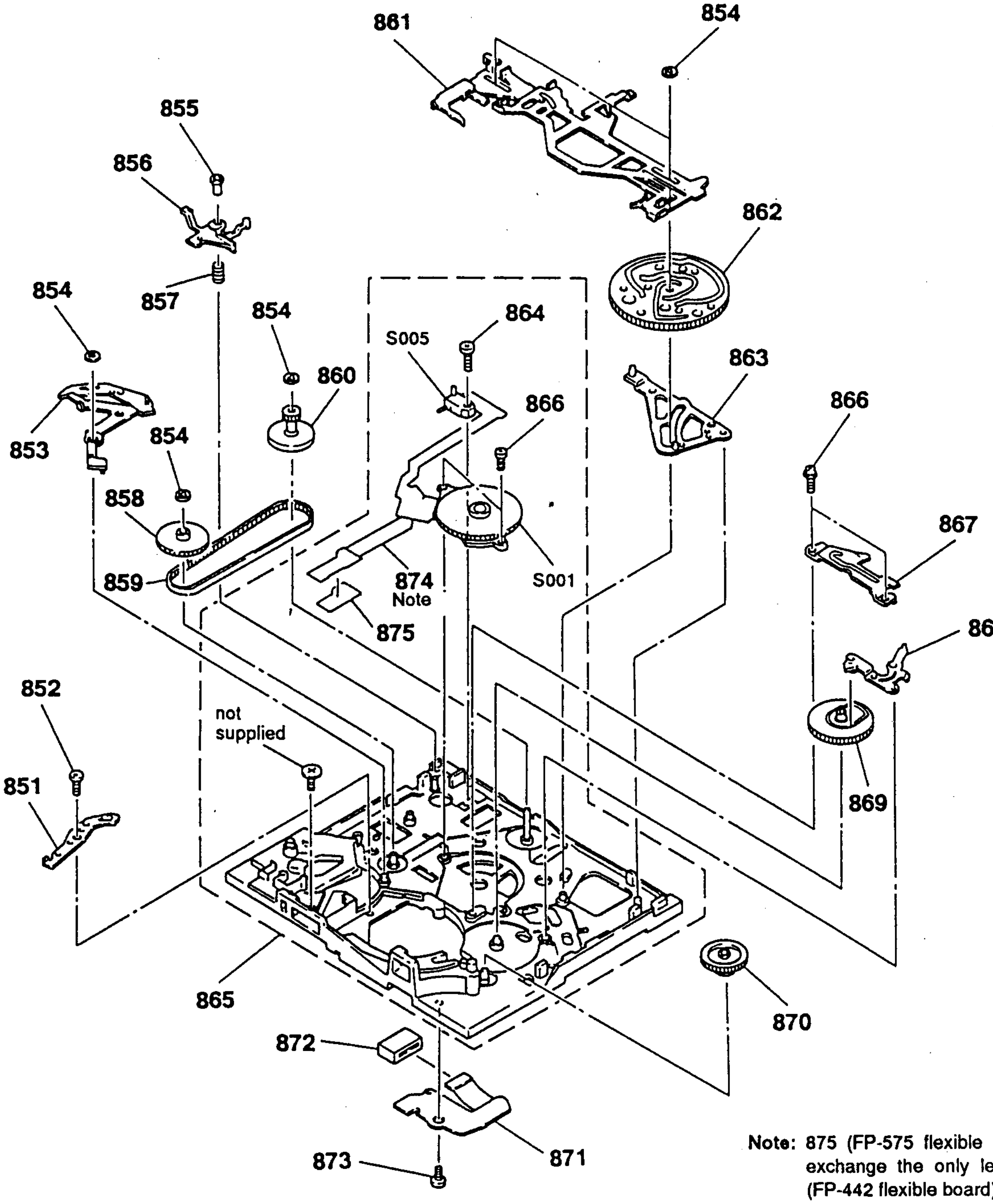
Ref.No.	Part No.	Description	Remark
801	A-7049-501-A	DRUM ASSY, UPPER (DGR-78-R)	
802	3-945-822-01	SPRING, LEAF, TG7 ARM	
803	A-7040-305-A	ARM BLOCK ASSY, TG7	
804	3-947-503-01	SCREW (M1.4X2.5)	
805	X-3941-255-1	PLATE (T) ASSY, SIDE	
806	3-945-735-01	ARM, HC CONVERSION	
807	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	
808	3-945-691-01	PLATE (S), SIDE	
809	3-945-701-01	ARM, LS	
810	3-945-702-01	ROLLER, LS	
811	X-3941-262-1	ROLLER ASSY, TG2	
812	3-956-651-01	SPRING, COMPRESSION	
813	3-686-493-01	SCREW (M2X5), P1	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-12	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-1-11. MECHANISM CHASSIS ASSEMBLY (2)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S005
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Note
S001
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not supplied
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Note: 875 (FP-575 flexible board) is part that exchange the only leading part of 874 (FP-442 flexible board).

Ref. No.	Part No.	Description	Remark
851	3-945-734-01	ARM, HC DRIVING	
852	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
853	X-3941-259-1	ARM ASSY, PINCH PRESS	
854	3-726-829-01	WASHER, STOPPER	
855	3-945-730-01	SLEEVE, EJECT	
856	3-945-706-01	LEVER, EJECT	
857	3-945-729-01	SPRING, COMPRESSION	
858	X-3941-256-1	GEAR ASSY, CHANGE	
859	3-944-539-01	BELT, RELAY	
860	3-945-695-01	PULLEY, RELAY	
861	X-3941-260-1	SLIDER ASSY, M	
862	3-945-696-02	CAM	
863	X-3941-258-3	ARM ASSY, GL	
864	3-713-786-71	SCREW (M2X5)	

Ref. No.	Part No.	Description	Remark
865	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
866	3-947-503-01	SCREW (M1.4X2.5)	
867	3-945-722-01	RETAINER, GEAR	
868	X-3941-257-1	ARM ASSY, FF	
869	3-945-697-01	GEAR (B), L	
870	3-945-700-01	GEAR (A), L	
871	1-641-643-12	FP-444 FLEXIBLE BOARD	
872	1-691-254-13	CONNECTOR, TRANSLATION 10P	
873	3-945-756-01	SCREW (M1.4X3)	
874	1-641-639-13	FP-442 FLEXIBLE BOARD	
875	1-645-271-11	FP-575 FLEXIBLE BOARD	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

5-2. ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Hardware (# mark) list is given in the last of this parts list.
- Canadian model is abbreviated as CND.
  Hong Kong model is abbreviated as HK.

- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description				Remark
	A-7066-293-A	AU-183 BOARD, COMPLETE				
		**********************				
				(Ref. No. 3, 000 Series)		
		< CAPACITOR >				
C402	1-165-176-11	CERAMIC CHIP	0. 047uF	10%	16V	
C403	1-164-222-11	CERAMIC CHIP	0. 22uF		25V	
C404	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V	
C405	1-164-677-11	CERAMIC CHIP	0. 033uF	10%	16V	
C407	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C408	1-164-232-11	CERAMIC CHIP	0. 01uF		50V	
C409	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V	
C411	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V	
C412	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V	
C413	1-126-209-11	ELECT	100uF	20%	4V	
C414	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V	
C415	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C416	1-162-925-11	CERAMIC CHIP	68PF	5%	50V	
C419	1-162-967-11	CERAMIC CHIP	0. 0033uF	10%	50V	
C421	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C422	1-216-864-11	METAL CHIP	0	5%	1/16W	
C424	1-162-923-11	CERAMIC CHIP	47PF	5%	50V	
C425	1-164-346-11	CERAMIC CHIP	1uF		16V	
C426	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C428	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V	
C429	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C430	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C431	1-162-969-11	CERAMIC CHIP	0. 0068uF	10%	25V	
C432	1-164-674-11	CERAMIC CHIP	1800PF	5%	16V	
C433	1-164-346-11	CERAMIC CHIP	1uF		16V	
C434	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C435	1-162-966-11	CERAMIC CHIP	0. 0022uF	10%	50V	
C436	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V	
C437	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V	
C438	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V	
C439	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C440	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C441	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V	
C442	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C443	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V	

Ref. No.	Part No.	Description				Remark
		< CONNECTOR >				
CN401	1-691-516-11	CONNECTOR, BOARD TO BOARD 24P				
CN402	1-691-487-21	CONNECTOR, FFC/FPC 8P				
		< IC >				
IC401	8-759-823-19	IC CXA1488RR				
		< COIL >				
L401	1-412-954-11	INDUCTOR 18uH				
		< TRANSISTOR >				
Q404	8-729-402-81	TRANSISTOR XN4501				
		< RESISTOR >				
R401	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R403	1-216-859-11	METAL GLAZE	1. 5M	5%	1/16W	
R404	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R407	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R409	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R411	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R412	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R415	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R416	1-216-864-11	METAL CHIP	0	5%	1/16W	
R418	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R420	1-216-832-11	METAL CHIP	8. 2K	5%	1/16W	
R423	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R424	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R425	1-216-810-11	METAL CHIP	120	5%	1/16W	
R429	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W	
R430	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R431	1-216-823-11	METAL CHIP	1. 5K	5%	1/16W	
R432	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R433	1-216-817-11	METAL CHIP	470	5%	1/16W	
R434	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R435	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R436	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R442	1-216-817-11	METAL CHIP	470	5%	1/16W	

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Ref. No.	Part No.	Description				Remark
	A-7072-135-A	CD-137 B BOARD, COMPLETE				
		************************				
						(Ref. No. 1,000 Series)
		< CAPACITOR >				
C691	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V	
C692	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C693	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C694	1-164-346-11	CERAMIC CHIP	1uF		16V	
C695	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C696	1-104-908-11	TANTAL. CHIP	47uF	20%	4V	
		< IC >				
IC691	A-7030-368-A	CCD BLOCK ASSY (054 SERVICE)(CCD IMAGER)				
		< COIL >				
L691	1-412-963-11	INDUCTOR 100uH				
		< TRANSISTOR >				
Q691	8-729-232-86	TRANSISTOR	2SK1875-BL/V			
Q692	8-729-117-73	TRANSISTOR	2SC4178-F14			
		< RESISTOR >				
R692	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R693	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R694	1-216-045-00	METAL CHIP	680	5%	1/10W	
R695	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R696	1-216-809-11	METAL CHIP	100	5%	1/16W	
R697	1-216-073-00	METAL CHIP	10K	5%	1/10W	
		< FLEXIBLE BOARD >				
W691	1-654-849-11	FP-275 FLEXIBLE BOARD				
W692	1-654-849-11	FP-275 FLEXIBLE BOARD				

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Ref. No.	Part No.	Description				Remark
	A-7066-294-A	DD-77(SL) BOARD, COMPLETE (TR23/TR380)				
		*************************				
	A-7066-316-A	DD-77(SLC) BOARD, COMPLETE (TR33/TR460)				
		**************************				
						(Ref. No. 5,000 Series)
		< CAPACITOR >				
C901	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V	
C902	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C903	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	
C904	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	
C906	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V	
C907	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C908	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C909	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C910	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C911	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C912	1-128-530-11	ELECT CHIP	33uF	20%	10V	
C913	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C914	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C915	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C917	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C918	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C920	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C921	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C923	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C924	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C925	1-164-506-11	CERAMIC CHIP	4.7uF		16V	
C926	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C927	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C928	1-165-178-11	CERAMIC CHIP	6.8uF		16V	
C929	1-135-216-11	TANTALUM CHIP	10uF	20%	10V	
C930	1-107-418-11	ELECT CHIP	10uF	20%	35V	
C931	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C932	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C934	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C936	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C938	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C939	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V	
C940	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V	
C941	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	
C942	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C943	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	
C944	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	
C945	1-128-530-11	ELECT CHIP	33uF	20%	10V	
C946	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C950	1-128-004-11	ELECT CHIP	10uF	20%	16V	
		< CONNECTOR >				
CN901	1-695-324-11	CONNECTOR, BOARD TO BOARD 42P				
		< DIODE >				
D901	8-719-027-77	DIODE	MA796-TX			
D909	8-719-404-49	DIODE	MA111			
D910	8-719-404-49	DIODE	MA111			
		< FUSE >				
⚠F450	1-576-213-11	FUSE, CHIP				
⚠F451	1-576-213-11	FUSE, CHIP				
⚠F452	1-576-213-11	FUSE, CHIP				
		< IC >				
IC901	8-759-295-31	IC	MB3799-03PFV-G-BND-ER			

Be sure to read "Note on the CCD Imager replacement" on page 4–5 when changing the CCD imager.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
		< JACK >	
J901	1-537-281-11	TERMINAL BOARD (BATTERY TERMINAL)	
J902	1-565-276-21	JACK, ULTRA SMALL 1P (LANC)	
J903	1-568-027-11	JACK, SMALL TYPE 1P (PHONES)	
		< COIL >	
L901	1-424-653-11	COIL, CHOKE 10uH	
L902	1-424-653-11	COIL, CHOKE 10uH	
L903	1-424-653-11	COIL, CHOKE 10uH	
L904	1-409-556-11	COIL, CHOKE 47uH	
L905	1-424-674-11	COIL, CHOKE 22uH	
L906	1-409-556-11	COIL, CHOKE 47uH	
L907	1-424-674-11	COIL, CHOKE 22uH	
L908	1-424-674-11	COIL, CHOKE 22uH	
L909	1-412-056-11	INDUCTOR CHIP 4.7uH	
L910	1-412-056-11	INDUCTOR CHIP 4.7uH	
L912	1-412-056-11	INDUCTOR CHIP 4.7uH	
L914	1-412-064-11	INDUCTOR CHIP 100uH	
L915	1-412-064-11	INDUCTOR CHIP 100uH	
L916	1-412-056-11	INDUCTOR CHIP 4.7uH	
L917	1-412-056-11	INDUCTOR CHIP 4.7uH	
L918	1-216-296-00	METAL CHIP 0 5% 1/8W	
L919	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< TRANSISTOR >	
Q900	8-729-422-14	TRANSISTOR XN4111 (TR33/TR460)	
Q901	8-729-420-12	TRANSISTOR XN4213	
Q902	8-729-804-41	TRANSISTOR 2SB1122-S	
Q903	8-729-823-82	TRANSISTOR FP101	
Q904	8-729-823-84	TRANSISTOR FP102	
Q905	8-729-823-82	TRANSISTOR FP101	
Q906	8-729-823-82	TRANSISTOR FP101	
Q907	8-729-823-82	TRANSISTOR FP101	
Q908	8-729-420-12	TRANSISTOR XN4213 (TR33/TR460)	
Q909	8-729-805-25	TRANSISTOR 2SB1121	
Q910	8-729-429-32	TRANSISTOR UN9210-QRS (TR33/TR460)	
Q914	8-729-402-42	TRANSISTOR UN5213	
Q915	8-729-402-42	TRANSISTOR UN5213	
		< RESISTOR >	
R901	1-218-872-11	METAL CHIP 11K 0.50% 1/16W	
R902	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R903	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R904	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R905	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R906	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R907	1-216-035-00	METAL CHIP 270 5% 1/10W	
R908	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R909	1-216-031-00	METAL CHIP 180 5% 1/10W	
R910	1-216-029-00	METAL CHIP 150 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R911	1-216-029-00	METAL CHIP 150 5% 1/10W	
R912	1-216-029-00	METAL CHIP 150 5% 1/10W	
R913	1-216-041-00	METAL CHIP 470 5% 1/10W	
R916	1-216-864-11	METAL CHIP 0 5% 1/16W	
R917	1-216-864-11	METAL CHIP 0 5% 1/16W	
R918	1-216-819-11	METAL CHIP 680 5% 1/16W	
R919	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R920	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R922	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R924	1-216-864-11	METAL CHIP 0 5% 1/16W	
R925	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R927	1-216-814-11	METAL CHIP 270 5% 1/16W	(TR33/TR460)
R927	1-216-864-11	METAL CHIP 0 5% 1/16W	(TR23/TR380)
R928	1-216-852-11	METAL CHIP 390K 5% 1/16W	
R932	1-216-864-11	METAL CHIP 0 5% 1/16W	
R936	1-216-864-11	METAL CHIP 0 5% 1/16W	
R937	1-216-864-11	METAL CHIP 0 5% 1/16W	(TR23/TR380)
R938	1-216-864-11	METAL CHIP 0 5% 1/16W	(TR23/TR380)
R939	1-216-864-11	METAL CHIP 0 5% 1/16W	(TR33/TR460)
R940	1-216-864-11	METAL CHIP 0 5% 1/16W	(TR23/TR380)
R941	1-218-849-11	METAL CHIP 1.2K 0.50% 1/16W	
R943	1-216-864-11	METAL CHIP 0 5% 1/16W	(TR33/TR460)
R944	1-216-864-11	METAL CHIP 0 5% 1/16W	(TR23/TR380)
R945	1-218-847-11	METAL CHIP 1K 0.50% 1/16W	
R946	1-216-841-11	METAL CHIP 47K 5% 1/16W	(TR33/TR460)
R947	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	(TR33/TR460)
R948	1-216-837-11	METAL CHIP 22K 5% 1/16W	(TR33/TR460)
R949	1-216-841-11	METAL CHIP 47K 5% 1/16W	(TR33/TR460)
		< TRANSFORMER >	
⚠T901	1-426-938-11	TRANSFORMER, DC/DC CONVERTER	(TR23/TR380)
⚠T901	1-427-676-21	TRANSFORMER, DC/DC CONVERTER	(TR33/TR460)

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Ref.No.	Part No.	Description	Remark
*	A-7056-012-A	LB-35 BOARD, COMPLETE (TR33/TR460)	
		**********************	
		(Ref.No. 4,000 Series)	
		< FLUORESCENT >	
BL801	1-517-325-11	LAMP, FLUORESCENT (0.55 INCH)	
		< CONNECTOR >	
CN801	1-573-812-11	CONNECTOR, BOARD TO BOARD 12P	
		< DIODE >	
D801	8-719-033-14	DIODE CL-170PG-CD-T	
**			
		LS-33 BOARD (Ref.No. 6,000 Series)	
		***********	
		< DIODE >	
D001	8-719-989-52	DIODE GL4600S	
		< HALL ELEMENT >	
H001	8-719-987-62	DIODE LT140SAZ	
H002	8-719-987-62	DIODE LT140SAZ	
		< TRANSISTOR >	
Q001	8-729-012-46	TRANSISTOR PT4600FS	
Q002	8-729-012-46	TRANSISTOR PT4600FS	
		< RESISTOR >	
R003	1-216-033-00	METAL CHIP 220 5% 1/10W	
R004	1-216-033-00	METAL CHIP 220 5% 1/10W	
R010	1-216-033-00	METAL CHIP 220 5% 1/10W	
R011	1-216-033-00	METAL CHIP 220 5% 1/10W	
		< SWITCH >	
S002	1-572-987-11	SWITCH, PUSH (3 KEY)(TAPE SELECT)	
**			
	A-7066-297-A	MA-231 BOARD, COMPLETE	
		**********************	
		(Ref.No. 3,000 Series)	
		< CAPACITOR >	
C014	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C015	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C032	1-164-346-11	CERAMIC CHIP 1uF 16V	
C033	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C034	1-162-974-11	CERAMIC CHIP 0.01uF 50V	

Ref.No.	Part No.	Description	Remark
C035	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C036	1-164-344-11	CERAMIC CHIP 0.068uF 10% 25V	
C037	1-164-346-11	CERAMIC CHIP 1uF 16V	
C040	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C041	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C044	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C045	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
		< CONNECTOR >	
CN001	1-691-487-21	CONNECTOR, FFC/FPC 8P	
* CN003	1-580-055-21	PIN, CONNECTOR 2P	
		< DIODE >	
D004	8-719-404-19	DIODE LN1251C	
		< IC >	
IC002	8-749-925-07	IC RS-30E-T	
IC003	8-759-822-37	IC LA7293M-TE-L	
		< JACK >	
J001	1-568-027-11	JACK, SMALL TYPE 1P (MIC, PLUG IN POWER)	
		< COIL >	
L002	1-216-295-91	CONDCTOR, CHIP (2012)	
L003	1-216-295-91	CONDCTOR, CHIP (2012)	
		< TRANSISTOR >	
Q002	8-729-420-24	TRANSISTOR SB1218A-QRS	
		< RESISTOR >	
R028	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R029	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R030	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R031	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R032	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R033	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R043	1-216-815-11	METAL CHIP 330 5% 1/16W	
R044	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R045	1-216-834-11	METAL CHIP 12K 5% 1/16W	
**			
	A-7072-167-A	SL-38(SL) BOARD, COMPLETE	
		**************************	
		(Ref.No. 3,000 Series)	
		< CAPACITOR >	
C543	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C544	1-163-059-91	CERAMIC CHIP 0.01uF 10% 50V	
C545	1-163-059-91	CERAMIC CHIP 0.01uF 10% 50V	

Ref. No.	Part No.	Description			Remark
C546	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C547	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C551	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C553	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C554	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C555	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C556	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C557	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C558	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
		< CONNECTOR >			
CN500	1-691-473-21	CONNECTOR, FFC/FPC 7P			
CN501	1-691-472-21	CONNECTOR, FFC/FPC 6P			
CN502	1-691-482-21	CONNECTOR, FFC/FPC 15P			
		< IC >			
IC507	8-759-165-47	IC MPC1780VFUEB			
		< COIL >			
L505	1-216-295-91	CONDCTOR, CHIP (2012)			
		< TRANSISTOR >			
Q560	8-729-805-25	TRANSISTOR 2SB1121			
Q561	8-729-425-50	TRANSISTOR 2SB1462Q			
Q562	8-729-402-81	TRANSISTOR XN4501			
		< RESISTOR >			
R562	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R563	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R564	1-216-864-11	METAL CHIP	0	5%	1/16W
R565	1-216-833-11	METAL CHIP	10K	5%	1/16W
R566	1-218-857-11	METAL CHIP	2.7K	0.50%	1/16W
R567	1-216-295-91	CONDCTOR, CHIP (2012)			
R568	1-216-168-00	METAL GLAZE	56	5%	1/8W
R569	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R570	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R571	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R572	1-216-841-11	METAL CHIP	47K	5%	1/16W
R590	1-216-833-11	METAL CHIP	10K	5%	1/16W
R591	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
		< FLEXIBLE BOARD >			
W500	1-651-889-11	FP-48 FLEXIBLE BOARD			
W501	1-642-186-11	FP-437 FLEXIBLE BOARD			

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Ref. No.	Part No.	Description			Remark
	A-7066-296-A	VC-160(SL) BOARD, COMPLETE			
		***************************			
					(Ref.No. 2,000 Series)
		< CAPACITOR >			
C601	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C604	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C606	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C607	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C608	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C610	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C611	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C613	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C614	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C616	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C617	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C618	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C619	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C620	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C621	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C622	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C623	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C624	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C627	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C628	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C629	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C630	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C632	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C633	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C634	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C637	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C638	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C643	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C645	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C646	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C696	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C701	1-163-059-91	CERAMIC CHIP	0.01uF	10%	50V
C702	1-162-638-11	CERAMIC CHIP	1uF		16V
C703	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C704	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C705	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C706	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C708	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C709	1-163-077-91	CERAMIC CHIP	0.1uF		50V
C710	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C711	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C712	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C713	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C715	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C716	1-164-360-11	CERAMIC CHIP	0.1uF		16V

Ref. No.	Part No.	Description				Remark
C717	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C718	1-162-637-11	CERAMIC CHIP	0.47uF		16V	
C719	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C721	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C724	1-162-925-11	CERAMIC CHIP	68PF	5%	50V	
C725	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C726	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C727	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C728	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C729	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C730	1-164-298-11	CERAMIC CHIP	0.15uF	10%	25V	
C731	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C732	1-162-638-11	CERAMIC CHIP	1uF		16V	
C733	1-162-638-11	CERAMIC CHIP	1uF		16V	
C734	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C735	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C737	1-162-946-11	CERAMIC CHIP	27PF	5%	50V	
C739	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C742	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C743	1-162-638-11	CERAMIC CHIP	1uF		16V	
C745	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C746	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C747	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C748	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C750	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C751	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C752	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C754	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C755	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C756	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V	
C757	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
		< CONNECTOR >				
* CN601	1-764-395-21	CONNECTOR, BOARD TO BOARD 42P				
CN701	1-750-630-11	CONNECTOR, FFC/FPC (ZIF) 16P				
CN751	1-764-528-11	CONNECTOR, FFC/FPC (ZIF) 21P				
		< TRIMMER >				
CT701	1-141-356-11	CAP, ADJ				
		< DIODE >				
D701	8-719-404-49	DIODE	MA111			
D702	8-719-404-49	DIODE	MA111			
D703	8-719-404-49	DIODE	MA111			
D705	8-719-404-49	DIODE	MA111			
		< FILTER >				
FL601	1-239-766-11	FILTER, LOW PASS				

Ref. No.	Part No.	Description				Remark
		< IC >				
IC601	8-759-261-21	IC	S-29255AFE-TF			
IC602	8-759-332-94	IC	SC424614MC68HC11MA8FU			
IC603	8-759-064-36	IC	MB88346BPFV			
IC604	8-759-710-29	IC	NJM2235M			
IC609	8-752-369-23	IC	CXD2150AR-T6			
IC610	8-752-365-72	IC	CXD2151R-T6			
IC611	8-759-262-36	IC	CXD2133BR-T6			
IC614	8-759-255-09	IC	uPD6461GS-802-GLG-E2			
IC701	8-752-355-07	IC	CXD1267N-T4			
IC702	8-752-365-74	IC	CXD1266R-T4			
IC703	8-752-069-21	IC	CXA1690Q-T4			
IC704	8-759-263-29	IC	HD49315FEB			
IC705	8-752-373-69	IC	CXD2407BR-T4			
IC751	8-759-701-24	IC	NJM3414M			
IC752	8-759-058-50	IC	XRA10324AF-E2			
IC753	8-752-365-65	IC	CXD2126N-T4			
IC754	8-759-247-07	IC	MPC17A34VMEL			
IC755	8-759-031-58	IC	SC7SU04F			
		< COIL >				
L601	1-412-058-11	INDUCTOR CHIP	10uH			
L604	1-414-078-11	INDUCTOR	10uH			
L605	1-410-391-11	INDUCTOR CHIP	68uH			
L608	1-412-006-31	INDUCTOR CHIP	10uH			
L704	1-412-058-11	INDUCTOR CHIP	10uH			
L751	1-412-062-11	INDUCTOR CHIP	47uH			
		< TRANSISTOR >				
Q604	8-729-010-60	TRANSISTOR	MSA1586-BC			
Q605	8-729-010-60	TRANSISTOR	MSA1586-BC			
Q606	8-729-010-75	TRANSISTOR	MSC4116-BC			
Q607	8-729-010-75	TRANSISTOR	MSC4116-BC			
Q701	8-729-403-27	TRANSISTOR	XN4401			
Q751	8-729-010-75	TRANSISTOR	MSC4116-BC			
Q752	8-729-015-76	TRANSISTOR	UN5211-TX			
		< RESISTOR >				
R601	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R602	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R603	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R604	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R605	1-216-864-11	METAL CHIP	0	5%	1/16W	
R606	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R607	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R608	1-216-864-11	METAL CHIP	0	5%	1/16W	
R609	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R610	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R611	1-216-838-11	METAL CHIP	27K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R612	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R613	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R619	1-216-803-11	METAL CHIP	33	5%	1/16W	
R620	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R621	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R624	1-216-864-11	METAL CHIP	0	5%	1/16W	
R626	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R627	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R628	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R629	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R630	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R631	1-216-864-11	METAL CHIP	0	5%	1/16W	
R634	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R635	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R636	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R637	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R638	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R640	1-216-815-11	METAL CHIP	330	5%	1/16W	
R642	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R643	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R645	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R646	1-216-818-11	METAL CHIP	560	5%	1/16W	
R647	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R648	1-216-818-11	METAL CHIP	560	5%	1/16W	
R649	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R650	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R651	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R652	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R653	1-216-864-11	METAL CHIP	0	5%	1/16W	
R656	1-216-864-11	METAL CHIP	0	5%	1/16W	
R658	1-216-864-11	METAL CHIP	0	5%	1/16W	
R659	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R661	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R662	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R663	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R664	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R665	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R666	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R667	1-216-820-11	METAL CHIP	820	5%	1/16W	
R668	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R669	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R670	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R671	1-216-296-00	METAL CHIP	0	5%	1/8W	
R672	1-216-296-00	METAL CHIP	0	5%	1/8W	
R701	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R702	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R703	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R704	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R705	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R709	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R710	1-216-864-11	METAL CHIP	0	5%	1/16W	
R712	1-216-864-11	METAL CHIP	0	5%	1/16W	
R713	1-216-807-11	METAL CHIP	68	5%	1/16W	
R714	1-216-864-11	METAL CHIP	0	5%	1/16W	
R716	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R718	1-216-807-11	METAL CHIP	68	5%	1/16W	
R719	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R720	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R721	1-216-864-11	METAL CHIP	0	5%	1/16W	
R722	1-216-864-11	METAL CHIP	0	5%	1/16W	
R724	1-216-864-11	METAL CHIP	0	5%	1/16W	
R725	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R728	1-216-864-11	METAL CHIP	0	5%	1/16W	
R729	1-216-864-11	METAL CHIP	0	5%	1/16W	
R730	1-216-296-00	METAL CHIP	0	5%	1/8W	
R741	1-218-855-11	METAL CHIP	2.2K	0.50%	1/16W	
R742	1-218-865-11	METAL CHIP	5.6K	0.50%	1/16W	
R743	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R744	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R745	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R746	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R747	1-216-820-11	METAL CHIP	820	5%	1/16W	
R748	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R749	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R750	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R751	1-216-809-11	METAL CHIP	100	5%	1/16W	
R752	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R753	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R754	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R755	1-216-855-11	METAL CHIP	680K	5%	1/16W	
R756	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R757	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R758	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R759	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R760	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R761	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R762	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R764	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R799	1-216-296-00	METAL CHIP	0	5%	1/8W	

< VIBRATOR >

X601	1-760-081-21	VIBRATOR, CERAMIC (24MHz)	
X701	1-760-320-11	VIBRATOR, CRYSTAL (28.6363MHz)	

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Ref. No.	Part No.	Description	Remark
	A-7063-957-A	VF-65 BOARD, COMPLETE (TR23/TR380)	
		**********************	
			(Ref. No. 4,000 Series)
		< CAPACITOR >	
C901	1-124-635-00	ELECT 220uF 20% 6.3V	
C902	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C903	1-135-091-91	TANTAL. CHIP 1uF 20% 16V	
C904	1-163-011-11	CERAMIC CHIP 0.0015uF 10% 50V	
C905	1-104-753-11	TANTAL. CHIP 47uF 20% 6.3V	
C906	1-162-638-11	CERAMIC CHIP 1uF 16V	
C907	1-137-306-11	FILM CHIP 0.1uF 5% 16V	
C908	1-163-243-11	CERAMIC CHIP 47PF 5% 50V	
C909	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
⚠C910	1-164-758-11	CERAMIC CHIP 0.0039uF 5% 50V	
⚠C911	1-164-715-11	CERAMIC CHIP 0.0068uF 5% 50V	
C912	1-127-532-11	ELECT(SOLID) 47uF 20% 6.3V	
C913	1-124-577-11	ELECT 82uF 20% 10V	
C914	1-128-007-11	ELECT CHIP 2.2uF 20% 35V	
C915	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C916	1-164-611-11	CERAMIC CHIP 0.001uF 10% 500V	
C917	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
		< CONNECTOR >	
CN901	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
CN902	1-573-290-21	PIN, CONNECTOR (1.5MM) (SMD) 4P	
		< DIODE >	
D901	8-719-404-19	DIODE LN1251C	
D903	8-719-400-20	DIODE MA152WA	
		< IC >	
IC901	8-759-196-14	IC BA7149F-E2	
		< COIL >	
⚠L901	1-412-031-11	INDUCTOR CHIP 47uH	
L902	1-410-389-31	INDUCTOR CHIP 47uH	
⚠L903	1-402-680-21	COIL, FERRITE (HCL)	
		< TRANSISTOR >	
⚠Q901	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q902	8-729-106-68	TRANSISTOR 2SD1615A-GP	
Q903	8-729-216-31	TRANSISTOR 2SA1163-G	
Q904	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
		< RESISTOR >	
R901	1-216-041-00	METAL CHIP 470 5% 1/10W	
R902	1-216-041-00	METAL CHIP 470 5% 1/10W	
R903	1-216-035-00	METAL CHIP 270 5% 1/10W	
⚠R904	1-216-073-00	METAL CHIP 10K 5% 1/10W	
⚠R905	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R906	1-216-047-00	METAL CHIP 820 5% 1/10W	
R907	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R908	1-216-111-00	METAL CHIP 390K 5% 1/10W	
R909	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R910	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R911	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R912	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R913	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R914	1-216-025-00	METAL CHIP 100 5% 1/10W	
R915	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R916	1-208-814-11	METAL CHIP 22K 0.50% 1/10W	
R917	1-208-824-11	METAL CHIP 56K 0.50% 1/10W	
R918	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R919	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R920	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R921	1-216-311-00	METAL CHIP 6.8 5% 1/10W	
R922	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R923	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R924	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R925	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R926	1-216-295-91	CONDCTOR, CHIP (2012)	
R927	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R928	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R929	1-216-037-00	METAL CHIP 330 5% 1/10W	
		< VARIABLE RESISTOR >	
RV903	1-238-086-11	RES, ADJ, CERMET 470	
RV904	1-223-566-11	RES, ADJ, METAL GLAZE 1M	
		< TRANSFORMER >	
⚠T901	1-453-124-11	TRANSFORMER ASSY, FLYBACK	
		< THERMISTOR >	
TH901	1-809-350-21	THERMISTOR, NTC (2125)	
		< SOCKET >	
⚠W901	1-540-019-21	SOCKET ASSY, CRT	
		**	
⚠	A-7066-010-A	VF-66 BOARD, COMPLETE (TR33/TR460)	
		**********************	
			(Ref. No. 4,000 Series)
		< CAPACITOR >	
C851	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C852	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C853	1-104-916-11	TANTAL. CHIP 6.8uF 20% 20V	
C854	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
C855	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C856	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C857	1-164-676-11	CERAMIC CHIP	2200PF	5%	16V
C858	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C859	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C860	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C861	1-104-917-11	TANTAL. CHIP	15uF	20%	20V
C862	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C863	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C864	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C865	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C866	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C867	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C868	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C869	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C870	1-162-974-11	CERAMIC CHIP	0.01uF		50V

< CONNECTOR >

Ref. No.	Part No.	Description			Remark
CN851	1-573-354-11	CONNECTOR, FFC/FPC 14P			
CN852	1-573-354-11	CONNECTOR, FFC/FPC 14P			
CN853	1-573-811-11	CONNECTOR, BOARD TO BOARD 12P			

< DIODE >

Ref. No.	Part No.	Description			Remark
D851	8-719-989-22	DIODE	CL-150R-CD		
D852	8-719-043-70	DIODE	MA6S121-(TX)		
D853	8-719-802-36	DIODE	1SS250		

< IC >

Ref. No.	Part No.	Description			Remark
IC851	8-759-097-75	IC	MB3789PFV-G-BND-ER		
IC852	8-759-508-68	IC	XRA10358F-E2		

< COIL >

Ref. No.	Part No.	Description			Remark
L851	1-412-033-11	INDUCTOR CHIP	220uH		
L852	1-412-029-11	INDUCTOR CHIP	10uH		
L853	1-412-033-11	INDUCTOR CHIP	220uH		

< TRANSISTOR >

Ref. No.	Part No.	Description			Remark
Q851	8-729-024-60	TRANSISTOR	MTD6N15T4		
Q852	8-729-402-84	TRANSISTOR	XN4601		
Q853	8-729-923-62	TRANSISTOR	DTA123JK		

< RESISTOR >

Ref. No.	Part No.	Description			Remark
R851	1-216-819-11	METAL CHIP	680	5%	1/16W
R852	1-216-841-11	METAL CHIP	47K	5%	1/16W
R853	1-218-899-11	METAL CHIP	150K	0.50%	1/16W
R854	1-218-901-11	METAL CHIP	180K	0.50%	1/16W
R855	1-216-840-11	METAL CHIP	39K	5%	1/16W
R856	1-218-899-11	METAL CHIP	150K	0.50%	1/16W
R857	1-218-903-11	METAL CHIP	220K	0.50%	1/16W
R858	1-216-841-11	METAL CHIP	47K	5%	1/16W
R859	1-216-849-11	METAL CHIP	220K	5%	1/16W
R860	1-216-843-11	METAL CHIP	68K	5%	1/16W
R861	1-216-843-11	METAL CHIP	68K	5%	1/16W
R862	1-216-838-11	METAL CHIP	27K	5%	1/16W
R863	1-216-847-11	METAL CHIP	150K	5%	1/16W
R864	1-216-840-11	METAL CHIP	39K	5%	1/16W
R865	1-216-841-11	METAL CHIP	47K	5%	1/16W
R867	1-216-850-11	METAL CHIP	270K	5%	1/16W
R868	1-216-864-11	METAL CHIP	0	5%	1/16W
R869	1-216-843-11	METAL CHIP	68K	5%	1/16W
R870	1-216-842-11	METAL CHIP	56K	5%	1/16W
R871	1-216-850-11	METAL CHIP	270K	5%	1/16W
R872	1-216-833-11	METAL CHIP	10K	5%	1/16W
R873	1-216-851-11	METAL CHIP	330K	5%	1/16W
R874	1-216-847-11	METAL CHIP	150K	5%	1/16W
R875	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R876	1-216-833-11	METAL CHIP	10K	5%	1/16W
R877	1-216-794-11	METAL CHIP	5.6	5%	1/16W
R878	1-216-804-11	METAL CHIP	39	5%	1/16W
R879	1-216-837-11	METAL CHIP	22K	5%	1/16W
R880	1-216-839-11	METAL CHIP	33K	5%	1/16W
R881	1-216-853-11	METAL CHIP	470K	5%	1/16W
R891	1-216-296-00	METAL CHIP	0	5%	1/8W

< TRANSFORMER >

Ref. No.	Part No.	Description			Remark
T851	1-426-848-21	TRANSFORMER, INVERTER			

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A-7066-011-A VF-67 BOARD, COMPLETE (TR33/TR460)

(Ref.No. 4,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C901	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C902	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C903	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C904	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C905	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C906	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C907	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C908	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C909	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C910	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C911	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C913	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C914	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C915	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C916	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C917	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref.No.	Part No.	Description			Remark
C920	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C921	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C925	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C926	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C927	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C928	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C929	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C930	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C931	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C932	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C933	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C934	1-165-320-11	CERAMIC CHIP	0.47uF	10%	16V
C935	1-135-179-21	TANTAL. CHIP	2.2uF	20%	16V
C936	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C937	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C938	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C939	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C940	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C941	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C942	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C943	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C945	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C946	1-135-179-21	TANTAL. CHIP	2.2uF	20%	16V
C947	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C948	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C949	1-135-178-11	TANTAL. CHIP	1.5uF	20%	20V
C950	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C951	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C953	1-164-346-11	CERAMIC CHIP	1uF		16V
C954	1-162-974-11	CERAMIC CHIP	0.01uF		50V

< CONNECTOR >

Ref.No.	Part No.	Description
CN901	1-573-354-11	CONNECTOR, FFC/FPC 14P
* CN902	1-573-984-11	CONNECTOR, BOARD TO BOARD 10P
* CN903	1-573-356-11	CONNECTOR, FFC/FPC 16P

< DIODE >

Ref.No.	Part No.	Description	
D901	8-719-025-91	DIODE	MA365(E)-TX
D903	8-719-404-49	DIODE	MA111

< IC >

Ref.No.	Part No.	Description	
IC901	8-752-067-59	IC	CXA1785R-T4
IC902	8-752-371-14	IC	CXD2403AR-T4
IC903	8-759-251-40	IC	MB88E346PFV-G-BND-ER

< COIL >

Ref.No.	Part No.	Description
L901	1-412-951-11	INDUCTOR 10uH
L902	1-412-962-11	INDUCTOR 82uH
L904	1-412-959-11	INDUCTOR 47uH
L905	1-412-949-21	INDUCTOR 6.8uH
L906	1-412-962-11	INDUCTOR 82uH

< TRANSISTOR >

Ref.No.	Part No.	Description	
Q901	8-729-402-84	TRANSISTOR	XN4601
Q902	8-729-402-42	TRANSISTOR	UN5213

< RESISTOR >

Ref.No.	Part No.	Description			Remark
R902	1-218-877-11	METAL CHIP	18K	0.50%	1/16W
R903	1-216-842-11	METAL CHIP	56K	5%	1/16W
R904	1-216-857-11	METAL CHIP	1M	5%	1/16W
R906	1-216-841-11	METAL CHIP	47K	5%	1/16W
R907	1-216-833-11	METAL CHIP	10K	5%	1/16W
R908	1-216-821-11	METAL CHIP	1K	5%	1/16W
R910	1-216-814-11	METAL CHIP	270	5%	1/16W
R911	1-216-864-11	METAL CHIP	0	5%	1/16W
R912	1-216-821-11	METAL CHIP	1K	5%	1/16W
R914	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R919	1-216-839-11	METAL CHIP	33K	5%	1/16W
R920	1-216-839-11	METAL CHIP	33K	5%	1/16W
R921	1-220-397-11	METAL GLAZE	4.7M	5%	1/16W
R922	1-216-839-11	METAL CHIP	33K	5%	1/16W
R923	1-216-839-11	METAL CHIP	33K	5%	1/16W
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W
R925	1-216-839-11	METAL CHIP	33K	5%	1/16W
R926	1-216-841-11	METAL CHIP	47K	5%	1/16W
R930	1-216-833-11	METAL CHIP	10K	5%	1/16W
R931	1-216-839-11	METAL CHIP	33K	5%	1/16W
R933	1-216-864-11	METAL CHIP	0	5%	1/16W
R934	1-216-821-11	METAL CHIP	1K	5%	1/16W
R936	1-218-873-11	METAL CHIP	12K	0.50%	1/16W
R937	1-218-905-11	METAL CHIP	270K	0.50%	1/16W
R938	1-216-849-11	METAL CHIP	220K	5%	1/16W
R939	1-216-837-11	METAL CHIP	22K	5%	1/16W
R947	1-216-807-11	METAL CHIP	68	5%	1/16W
R948	1-216-807-11	METAL CHIP	68	5%	1/16W
R949	1-216-807-11	METAL CHIP	68	5%	1/16W
R953	1-216-840-11	METAL CHIP	39K	5%	1/16W
R954	1-216-840-11	METAL CHIP	39K	5%	1/16W
R959	1-216-844-11	METAL CHIP	82K	5%	1/16W
R960	1-216-845-11	METAL CHIP	100K	5%	1/16W
R961	1-216-850-11	METAL CHIP	270K	5%	1/16W
R969	1-216-839-11	METAL CHIP	33K	5%	1/16W
R970	1-216-839-11	METAL CHIP	33K	5%	1/16W
R971	1-216-844-11	METAL CHIP	82K	5%	1/16W
R973	1-216-839-11	METAL CHIP	33K	5%	1/16W
R974	1-216-839-11	METAL CHIP	33K	5%	1/16W
R979	1-216-849-11	METAL CHIP	220K	5%	1/16W (Last digit -12)
R980	1-216-864-11	METAL CHIP	0	5%	1/16W (Last digit -12)

Ref. No.	Part No.	Description			Remark

< VIBRATOR >

Ref. No.	Part No.	Description
X901	1-579-466-11	VIBRATOR, CRYSTAL (3.58MHz)

****

A-7066-295-A VS-124(SL) BOARD, COMPLETE (TR23/TR380)
****

A-7066-317-A VS-124(SLC) BOARD, COMPLETE (TR33/TR460)
****
(Ref.No. 10,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C101	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C102	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C106	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C107	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C108	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C109	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C110	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C112	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C113	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C114	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C115	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C116	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C117	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C118	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C119	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C120	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C121	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C122	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C123	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C124	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C128	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C131	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C134	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C136	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C137	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C143	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C144	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C145	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C146	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C147	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C148	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C149	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C150	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C151	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C152	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C154	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C157	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C158	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C159	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C160	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C161	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C163	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C164	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C165	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C166	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C167	1-164-382-11	CERAMIC CHIP	91PF	5%	50V
C168	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C169	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C172	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C179	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C190	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C204	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C205	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C206	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C207	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C208	1-128-007-11	ELECT CHIP	2.2uF	20%	35V
C209	1-126-246-11	ELECT CHIP	220uF	20%	4V
C210	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C211	1-128-013-11	ELECT CHIP	1uF	20%	50V
C212	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C213	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C214	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C215	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C216	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C217	1-128-013-11	ELECT CHIP	1uF	20%	50V
C218	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C219	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C220	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C222	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C225	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C226	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C227	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C228	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C229	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C230	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C231	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C232	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C234	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C235	1-126-207-11	ELECT CHIP	33uF	20%	4V
C238	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C239	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C240	1-164-392-11	CERAMIC CHIP	390PF	5%	50V
C241	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C242	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C243	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C244	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C245	1-164-360-11	CERAMIC CHIP	0.1uF		16V

Ref. No.	Part No.	Description			Remark
C246	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C247	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C251	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C258	1-164-346-11	CERAMIC CHIP	1uF		16V
C262	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C263	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C264	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C268	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C271	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C273	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C274	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C276	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C278	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C279	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C281	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C282	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C284	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C285	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C286	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C287	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C289	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C290	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C291	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C299	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C301	1-128-004-11	ELECT CHIP	10uF	20%	16V
C305	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C307	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C310	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C312	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C319	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C320	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C328	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C331	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C334	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V
C500	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C501	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C502	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C503	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C504	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C506	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C507	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C508	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C509	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C510	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C511	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C512	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C513	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C514	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C515	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C516	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C518	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C519	1-164-346-11	CERAMIC CHIP	1uF		16V
C521	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C522	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C523	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C524	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C525	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C526	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C527	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C528	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C529	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C530	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C531	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C532	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C533	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C534	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C535	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C536	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C537	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C539	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C540	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C541	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C543	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C544	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C545	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C546	1-164-346-11	CERAMIC CHIP	1uF		16V
C547	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C548	1-128-004-11	ELECT CHIP	10uF	20%	16V
C550	1-128-530-11	ELECT CHIP	33uF	20%	10V
C559	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C560	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C561	1-128-004-11	ELECT CHIP	10uF	20%	16V
C562	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C563	1-164-816-11	CERAMIC CHIP	220PF	2%	50V
C564	1-164-816-11	CERAMIC CHIP	220PF	2%	50V
C565	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C566	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C567	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C568	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C569	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C570	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C571	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C573	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V
C951	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C954	1-162-959-11	CERAMIC CHIP	330PF	5%	50V (TR33/TR460)
C955	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C956	1-164-360-11	CERAMIC CHIP	0.1uF		16V (TR33/TR460)

Ref. No.	Part No.	Description	Remark
C958	1-164-360-11	CERAMIC CHIP 0.1uF	16V (TR33/TR460)
C959	1-135-201-11	TANTALUM CHIP 10uF 20%	4V (TR33/TR460)
C967	1-165-128-11	CERAMIC CHIP 0.22uF	16V
		< CONNECTOR >	
CN101	1-691-492-21	CONNECTOR, FFC/FPC 13P	
CN102	1-580-789-21	PIN, CONNECTOR (SMD) 6P	
CN201	1-573-353-11	CONNECTOR, FFC/FPC 13P	
CN202	1-691-536-11	CONNECTOR, BOARD TO BOARD 24P	
* CN203	1-764-396-21	CONNECTOR, BOARD TO BOARD 42P	
CN206	1-573-923-21	CONNECTOR, FFC/FPC (ZIF) 14P	
CN502	1-764-708-11	CONNECTOR, FFC/FPC (LIF) 9P	
CN503	1-764-717-11	CONNECTOR, FFC/FPC (LIF) 18P	
CN504	1-695-325-11	CONNECTOR, BOARD TO BOARD 42P	
* CN505	1-764-397-21	CONNECTOR, BOARD TO BOARD 42P	
		< DIODE >	
D101	8-719-800-76	DIODE 1SS226	
D102	8-719-404-49	DIODE MA111	
D201	8-719-027-50	DIODE MA142WK-(TX)	
D204	8-719-027-50	DIODE MA142WK-(TX)	
D212	8-719-404-49	DIODE MA111	
D218	8-719-800-76	DIODE 1SS226	
D321	8-719-045-87	DIODE MA4Z082WA-TX	
⚠D501	8-719-421-27	DIODE MA728	
D504	8-719-404-49	DIODE MA111	
D505	8-719-404-49	DIODE MA111	
		< FILTER >	
FL201	1-236-757-21	FILTER, LOW PASS (C)	
		< IC >	
IC102	8-752-069-78	IC CXA1704R-T4	
IC201	8-752-068-58	IC CXA1700R-T6	
IC203	8-752-351-22	IC CXL5502N-T4	
IC205	8-752-053-21	IC CXA1211M	
IC501	8-759-278-57	IC AK6420HF-E2	
⚠IC502	8-759-295-62	IC S-8423DFS-T2	
IC503	8-759-267-67	IC MB89098PFV-G-107-BND	
IC505	8-752-851-37	IC CXP87132-009R	
IC506	8-759-169-11	IC CXA1575M-E2	
IC508	8-759-195-09	IC XR1083CQ-E2	
IC951	8-759-169-02	IC MB88344BPFV-G-BND-ER	
IC953	8-759-710-29	IC NJM2235M (TR33/TR460)	
		< COIL >	
L103	1-412-066-21	INDUCTOR CHIP 220uH	
L104	1-412-951-11	INDUCTOR 10uH	
L105	1-412-066-21	INDUCTOR CHIP 220uH	

Ref. No.	Part No.	Description	Remark
L108	1-412-060-11	INDUCTOR CHIP 22uH	
L109	1-412-957-11	INDUCTOR 33uH	
L110	1-410-657-21	INDUCTOR CHIP 180uH	
L111	1-412-950-11	INDUCTOR 8.2uH	
L112	1-412-280-31	INDUCTOR 330uH	
L113	1-412-957-11	INDUCTOR 33uH	
L114	1-412-282-41	INDUCTOR 470uH	
L115	1-412-280-31	INDUCTOR 330uH	
L116	1-410-657-21	INDUCTOR CHIP 180uH	
L118	1-410-655-31	INDUCTOR CHIP 120uH	
L120	1-412-951-11	INDUCTOR 10uH	
L203	1-412-955-11	INDUCTOR 22uH	
L204	1-412-963-11	INDUCTOR 100uH	
L207	1-412-945-11	INDUCTOR 3.3uH	
L209	1-412-960-21	INDUCTOR 56uH	
L213	1-412-953-11	INDUCTOR 15uH	
L214	1-412-962-11	INDUCTOR 82uH	
L503	1-412-961-11	INDUCTOR 68uH	
		< IC LINK >	
⚠PS500	1-576-122-21	LINK, IC (CCP2E10 0.4A)	
⚠PS501	1-576-122-21	LINK, IC (CCP2E10 0.4A)	
		< TRANSISTOR >	
Q101	8-729-905-23	TRANSISTOR 2SA1576-R	
Q102	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q103	8-729-216-22	TRANSISTOR 2SA1162	
Q104	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q105	8-729-402-42	TRANSISTOR UN5213	
Q106	8-729-402-42	TRANSISTOR UN5213	
Q109	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q111	8-729-015-74	TRANSISTOR UN5111-TX	
Q112	8-729-117-73	TRANSISTOR 2SC4178-F14	
Q113	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q114	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q115	8-729-012-50	TRANSISTOR 2SC4400-3/4/5	
Q117	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q119	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q126	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q129	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q132	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q133	8-729-012-50	TRANSISTOR 2SC4400-3/4/5	
Q134	8-729-402-48	TRANSISTOR UN521E-TX	
Q135	8-729-402-48	TRANSISTOR UN521E-TX	
Q202	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q204	8-729-402-42	TRANSISTOR UN5213	
Q216	8-729-402-42	TRANSISTOR UN5213	
Q217	8-729-420-12	TRANSISTOR XN4213	
Q219	8-729-230-63	TRANSISTOR 2SC4116-YG	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref.No.	Part No.	Description	Remark
Q225	8-729-015-76	TRANSISTOR UN5211-TX	
Q232	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q234	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q235	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q236	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q237	8-729-402-81	TRANSISTOR XN4501	
Q238	8-729-420-50	TRANSISTOR UN5215	
Q240	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q242	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q244	8-729-402-42	TRANSISTOR UN5213	
Q246	8-729-402-81	TRANSISTOR XN4501	
Q247	8-729-402-42	TRANSISTOR UN5213	
Q252	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q253	8-729-420-56	TRANSISTOR UN511E	
Q254	8-729-403-35	TRANSISTOR UN5113	
Q256	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q257	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q258	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q259	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q260	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q261	8-729-402-42	TRANSISTOR UN5213	
Q262	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q263	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q264	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q266	8-729-402-42	TRANSISTOR UN5213	
Q267	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q268	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q501	8-729-403-27	TRANSISTOR XN4401	
Q503	8-729-402-81	TRANSISTOR XN4501	
Q504	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q506	8-729-402-42	TRANSISTOR UN5213	
Q507	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q511	8-729-420-20	TRANSISTOR XN4312	
Q951	8-729-101-07	TRANSISTOR 2SB798-DL	
Q952	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q953	8-729-230-63	TRANSISTOR 2SC4116-YG (TR33/TR460)	
Q954	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q955	8-729-230-63	TRANSISTOR 2SC4116-YG (TR33/TR460)	
Q956	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q957	8-729-230-63	TRANSISTOR 2SC4116-YG (TR33/TR460)	
Q958	8-729-230-63	TRANSISTOR 2SC4116-YG	
		< RESISTOR >	
R101	1-216-864-11	METAL CHIP 0 5% 1/16W	
R102	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R103	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R104	1-216-819-11	METAL CHIP 680 5% 1/16W	
R105	1-216-819-11	METAL CHIP 680 5% 1/16W	
R106	1-216-814-11	METAL CHIP 270 5% 1/16W	
R107	1-216-813-11	METAL CHIP 220 5% 1/16W	

Ref.No.	Part No.	Description	Remark
R108	1-216-800-11	METAL GLAZE 18 5% 1/16W	
R109	1-216-804-11	METAL CHIP 39 5% 1/16W	
R110	1-216-818-11	METAL CHIP 560 5% 1/16W	
R111	1-218-875-11	METAL CHIP 15K 0.50% 1/16W	
R112	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R114	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R118	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R119	1-216-864-11	METAL CHIP 0 5% 1/16W	
R120	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R122	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R123	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R124	1-216-864-11	METAL CHIP 0 5% 1/16W	
R126	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R127	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R128	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R130	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R132	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R133	1-216-819-11	METAL CHIP 680 5% 1/16W	
R134	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R135	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R136	1-216-820-11	METAL CHIP 820 5% 1/16W	
R137	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R140	1-216-813-11	METAL CHIP 220 5% 1/16W	
R141	1-216-817-11	METAL CHIP 470 5% 1/16W	
R142	1-216-818-11	METAL CHIP 560 5% 1/16W	
R143	1-216-808-11	METAL CHIP 82 5% 1/16W	
R144	1-216-818-11	METAL CHIP 560 5% 1/16W	
R146	1-216-809-11	METAL CHIP 100 5% 1/16W	
R147	1-216-864-11	METAL CHIP 0 5% 1/16W	
R148	1-216-813-11	METAL CHIP 220 5% 1/16W	
R149	1-216-813-11	METAL CHIP 220 5% 1/16W	
R150	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R151	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R152	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R153	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R154	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R158	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R159	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R160	1-216-818-11	METAL CHIP 560 5% 1/16W	
R162	1-216-818-11	METAL CHIP 560 5% 1/16W	
R163	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R164	1-216-864-11	METAL CHIP 0 5% 1/16W	
R165	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R166	1-216-816-11	METAL CHIP 390 5% 1/16W	
R171	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R173	1-216-864-11	METAL CHIP 0 5% 1/16W	
R174	1-216-864-11	METAL CHIP 0 5% 1/16W	
R175	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R178	1-216-809-11	METAL CHIP 100 5% 1/16W	
R179	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R180	1-216-809-11	METAL CHIP	100	5%	1/16W	
R181	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R185	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R186	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R187	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R188	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R189	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R193	1-216-815-11	METAL CHIP	330	5%	1/16W	
R194	1-216-818-11	METAL CHIP	560	5%	1/16W	
R195	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R196	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R197	1-216-864-11	METAL CHIP	0	5%	1/16W	
R198	1-216-864-11	METAL CHIP	0	5%	1/16W	(TR33/TR460)
R199	1-216-864-11	METAL CHIP	0	5%	1/16W	(TR33/TR460)
R201	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R202	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R203	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R204	1-216-864-11	METAL CHIP	0	5%	1/16W	
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	
R207	1-216-804-11	METAL CHIP	39	5%	1/16W	
R209	1-216-814-11	METAL CHIP	270	5%	1/16W	
R210	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R211	1-216-803-11	METAL CHIP	33	5%	1/16W	
R212	1-216-864-11	METAL CHIP	0	5%	1/16W	
R213	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R214	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R215	1-216-819-11	METAL CHIP	680	5%	1/16W	
R216	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R218	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R219	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R220	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	(TR33/TR460)
R221	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R222	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	(TR33/TR460)
R223	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R224	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R226	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R228	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R229	1-216-864-11	METAL CHIP	0	5%	1/16W	
R230	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R231	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R232	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R233	1-216-809-11	METAL CHIP	100	5%	1/16W	
R234	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R235	1-218-877-11	METAL CHIP	18K	0.50%	1/16W	
R236	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R241	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R245	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R246	1-216-819-11	METAL CHIP	680	5%	1/16W	
R247	1-216-815-11	METAL CHIP	330	5%	1/16W	
R253	1-218-849-11	METAL CHIP	1.2K	0.50%	1/16W	
R255	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R256	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R259	1-218-859-11	METAL CHIP	3.3K	0.50%	1/16W	
R261	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R263	1-218-839-11	METAL GLAZE	470	0.50%	1/16W	
R265	1-216-818-11	METAL CHIP	560	5%	1/16W	
R272	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R273	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R274	1-216-864-11	METAL CHIP	0	5%	1/16W	
R279	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R283	1-216-864-11	METAL CHIP	0	5%	1/16W	
R285	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R286	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R288	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R289	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R290	1-216-864-11	METAL CHIP	0	5%	1/16W	
R291	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R295	1-216-864-11	METAL CHIP	0	5%	1/16W	
R296	1-216-815-11	METAL CHIP	330	5%	1/16W	
R297	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R300	1-216-817-11	METAL CHIP	470	5%	1/16W	
R302	1-216-864-11	METAL CHIP	0	5%	1/16W	
R303	1-216-810-11	METAL CHIP	120	5%	1/16W	
R304	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R305	1-216-820-11	METAL CHIP	820	5%	1/16W	
R307	1-216-813-11	METAL CHIP	220	5%	1/16W	
R308	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R309	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R311	1-216-864-11	METAL CHIP	0	5%	1/16W	
R312	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R313	1-216-817-11	METAL CHIP	470	5%	1/16W	
R314	1-216-864-11	METAL CHIP	0	5%	1/16W	
R315	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R316	1-216-815-11	METAL CHIP	330	5%	1/16W	
R317	1-216-820-11	METAL CHIP	820	5%	1/16W	
R318	1-216-820-11	METAL CHIP	820	5%	1/16W	
R319	1-216-818-11	METAL CHIP	560	5%	1/16W	
R321	1-216-813-11	METAL CHIP	220	5%	1/16W	
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R323	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R325	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R328	1-216-820-11	METAL CHIP	820	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R332	1-216-864-11	METAL CHIP	0	5%	1/16W	
R333	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R334	1-216-815-11	METAL CHIP	330	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R338	1-216-812-11	METAL CHIP	180	5%	1/16W	
R339	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R342	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R347	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R348	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R349	1-216-864-11	METAL CHIP	0	5%	1/16W	
R354	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R357	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R364	1-216-864-11	METAL CHIP	0	5%	1/16W	
R366	1-216-864-11	METAL CHIP	0	5%	1/16W	
R368	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R373	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R383	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R387	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R395	1-216-864-11	METAL CHIP	0	5%	1/16W	
R398	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R399	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R500	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R501	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R502	1-216-295-91	CONDCTOR, CHIP (2012)				
R503	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R505	1-216-864-11	METAL CHIP	0	5%	1/16W	
R506	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	(TR33/TR460)
R506	1-216-841-11	METAL CHIP	47K	5%	1/16W	(TR23/TR380)
R507	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R508	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R509	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R510	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R511	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R512	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R513	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R514	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R515	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R516	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R517	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R518	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R519	1-216-817-11	METAL CHIP	470	5%	1/16W	
R520	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R522	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R523	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R525	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R526	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R527	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R528	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R530	1-216-019-00	METAL CHIP	56	5%	1/10W	
R531	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R532	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R533	1-217-671-11	METAL CHIP	1	5%	1/10W	
R534	1-217-671-11	METAL CHIP	1	5%	1/10W	
R535	1-217-671-11	METAL CHIP	1	5%	1/10W	
R536	1-217-671-11	METAL CHIP	1	5%	1/10W	
R537	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R538	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R539	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R540	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R541	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R542	1-216-864-11	METAL CHIP	0	5%	1/16W	
R543	1-216-864-11	METAL CHIP	0	5%	1/16W	
R544	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R546	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R548	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R549	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R552	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R553	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R555	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R556	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R558	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R560	1-216-296-00	METAL CHIP	0	5%	1/8W	
R561	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R562	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R563	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R565	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R566	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R567	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R569	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R570	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R572	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R573	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R577	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R578	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R579	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R581	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R582	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R583	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R584	1-216-864-11	METAL CHIP	0	5%	1/16W	
R585	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R586	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R587	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R588	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R589	1-216-864-11	METAL CHIP	0	5%	1/16W	
R590	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R591	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R592	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R593	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R594	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R595	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description			Remark
R596	1-216-857-11	METAL CHIP	1M	5%	1/16W
R597	1-216-821-11	METAL CHIP	1K	5%	1/16W
R599	1-216-857-11	METAL CHIP	1M	5%	1/16W
R951	1-216-864-11	METAL CHIP	0	5%	1/16W
R952	1-216-864-11	METAL CHIP	0	5%	1/16W
R954	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R955	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R956	1-216-836-11	METAL CHIP	18K	5%	1/16W
R957	1-216-820-11	METAL CHIP	820	5%	1/16W
R960	1-216-821-11	METAL CHIP	1K	5%	1/16W
R962	1-216-840-11	METAL CHIP	39K	5%	1/16W (TR33/TR460)
R963	1-216-839-11	METAL CHIP	33K	5%	1/16W (TR33/TR460)
R964	1-216-839-11	METAL CHIP	33K	5%	1/16W (TR33/TR460)
R965	1-216-840-11	METAL CHIP	39K	5%	1/16W (TR33/TR460)
R966	1-216-864-11	METAL CHIP	0	5%	1/16W (TR23/TR380)
R967	1-216-847-11	METAL CHIP	150K	5%	1/16W (TR33/TR460)
R968	1-216-809-11	METAL CHIP	100	5%	1/16W (TR33/TR460)
R969	1-216-833-11	METAL CHIP	10K	5%	1/16W (TR33/TR460)
R970	1-216-821-11	METAL CHIP	1K	5%	1/16W (TR33/TR460)
R988	1-216-821-11	METAL CHIP	1K	5%	1/16W (TR33/TR460)
R989	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R990	1-216-837-11	METAL CHIP	22K	5%	1/16W
R991	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R992	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R993	1-216-821-11	METAL CHIP	1K	5%	1/16W
R994	1-216-834-11	METAL CHIP	12K	5%	1/16W
R995	1-216-817-11	METAL CHIP	470	5%	1/16W
R996	1-216-841-11	METAL CHIP	47K	5%	1/16W (TR23/TR380)
R1400	1-216-864-11	METAL CHIP	0	5%	1/16W
R1401	1-216-864-11	METAL CHIP	0	5%	1/16W
R1403	1-216-845-11	METAL CHIP	100K	5%	1/16W
R1404	1-216-857-11	METAL CHIP	1M	5%	1/16W
R1406	1-216-864-11	METAL CHIP	0	5%	1/16W
R1408	1-216-857-11	METAL CHIP	1M	5%	1/16W
R1412	1-216-864-11	METAL CHIP	0	5%	1/16W
R1413	1-216-864-11	METAL CHIP	0	5%	1/16W
R1414	1-216-864-11	METAL CHIP	0	5%	1/16W
R1415	1-216-864-11	METAL CHIP	0	5%	1/16W
R2009	1-216-864-11	METAL CHIP	0	5%	1/16W (TR33/TR460)
R2010	1-216-864-11	METAL CHIP	0	5%	1/16W (TR33/TR460)

< COMPOSITION CIRCUIT BLOCK >

Ref. No.	Part No.	Description	Remark
RB199	1-236-971-11	NETWORK, RES 0	(TR33/TR460)
RB501	1-236-432-11	NETWORK, RES 47K	
RB502	1-236-971-11	NETWORK, RES 0	
RB503	1-236-432-11	NETWORK, RES 47K	
RB504	1-236-412-11	NETWORK, RES 1.0K	
RB505	1-236-412-11	NETWORK, RES 1.0K	
RB506	1-236-412-11	NETWORK, RES 1.0K	
RB510	1-236-412-11	NETWORK, RES 1.0K	
RB512	1-236-412-11	NETWORK, RES 1.0K	
RB513	1-236-971-11	NETWORK, RES 0	
RB515	1-236-904-11	NETWORK, RES 1K	
RB516	1-236-904-11	NETWORK, RES 1K	
RB518	1-236-971-11	NETWORK, RES 0	
RB519	1-236-971-11	NETWORK, RES 0	
RB520	1-236-904-11	NETWORK, RES 1K	
RB523	1-236-432-11	NETWORK, RES 47K	
RB524	1-236-908-11	NETWORK, RES 10K	
RB525	1-236-424-11	NETWORK, RES 10K	
RB526	1-236-908-11	NETWORK, RES 10K	
RB527	1-236-424-11	NETWORK, RES 10K	
RB528	1-236-424-11	NETWORK, RES 10K	
RB529	1-236-424-11	NETWORK, RES 10K	
RB530	1-236-424-11	NETWORK, RES 10K	
RB531	1-236-424-11	NETWORK, RES 10K	
RB532	1-236-424-11	NETWORK, RES 10K	
RB535	1-236-908-11	NETWORK, RES 10K	
RB536	1-236-412-11	NETWORK, RES 1.0K	
RB537	1-236-412-11	NETWORK, RES 1.0K	
RB542	1-236-412-11	NETWORK, RES 1.0K	
RB543	1-236-412-11	NETWORK, RES 1.0K	
RB544	1-236-412-11	NETWORK, RES 1.0K	
RB549	1-236-971-11	NETWORK, RES 0	
RB550	1-236-971-11	NETWORK, RES 0	
RB552	1-236-412-11	NETWORK, RES 1.0K	
RB554	1-236-971-11	NETWORK, RES 0	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV202	1-238-086-11	RES, ADJ, CERMET 470	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X201	1-579-365-21	VIBRATOR, CRYSTAL (3.58MHz)	
X501	1-579-049-21	VIBRATOR, CRYSTAL (32kHz)	
X502	1-760-314-11	VIBRATOR, CRYSTAL (11.895MHz)	
XTL501	1-579-369-21	VIBRATOR (10MHz)	

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Ref. No.	Part No.	Description	Remark
*	A-7072-168-A	ZB-2(SL) BOARD, COMPLETE ************************	(Ref. No. 3,000 Series)
		< CONNECTOR >	
CN101	1-691-483-21	CONNECTOR, FFC/FPC 4P	
		< BATTERY HOLDER >	
LI101	1-550-104-11	HOLDER, BATTERY	

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MISCELLANEOUS

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Ref. No.	Part No.	Description	Remark
111	1-467-676-11	SWITCH BLOCK, CONTROL (CK)	
⚠162	1-452-673-11	CRT ASSY (M01KXX90WB)(TR23/TR380)	
163	1-651-894-11	FP-86 FLEXIBLE BOARD (TR23/TR380)	
167	1-651-903-11	FP-92 FLEXIBLE BOARD (TR33/TR460)	
168	1-651-893-11	FP-85 FLEXIBLE BOARD (TR33/TR460)	
176	8-753-015-00	LCX005AK-1 (TR33/TR460)	
201	1-467-649-81	SWITCH BLOCK, CONTROL (FK)	
208	1-691-471-11	CONNECTOR, TRANSLATION 11P	
212	1-651-891-11	FP-52 FLEXIBLE BOARD	
260	1-765-362-11	CABLE, FLAT (FFC-134)	
262	1-547-716-11	LENS, ZOOM (VCL-5412WA)(TYPE II)	
262	1-547-739-11	LENS, ZOOM (VCL-5412WB)(TYPE III)	
262	8-848-704-01	DEVICE, LENS LSV-140A (TYPE I)	
264	1-547-558-21	FILTER BLOCK, OPTICAL	
801	A-7049-501-A	DRUM ASSY, UPPER (DGR-78-R)	
814	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	
871	1-641-643-12	FP-444 FLEXIBLE BOARD	
872	1-691-254-13	CONNECTOR, TRANSLATION 10P	
874	1-641-639-13	FP-442 FLEXIBLE BOARD	
875	1-645-271-11	FP-575 FLEXIBLE BOARD	
BL801	1-517-325-11	LAMP, FLUORESCENT (0.55 INCH) (TR33/TR460)	
IC691	A-7030-368-A	CCD BLOCK ASSY (054 SERVICE)(CCD IMAGER)	
J201	1-537-731-11	TERMINAL BOARD	
M003	1-542-259-11	MICROPHONE, CAP	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-12	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY (Z), LM (LOADING)	
M905	1-698-364-01	MOTOR ASSY, FOCUS	
M906	1-698-363-01	MOTOR ASSY, ZOOM	
M907	3-708-888-01	METER, IG (IRIS)	
M908	3-708-889-01	MOTOR ASSY, FOCUS	
M909	3-708-887-01	MOTOR ASSY, ZOOM	
M910	3-708-898-01	IRIS ASSY	
M911	3-708-897-01	MOTOR ASSY, FOCUS	
M912	3-708-896-01	MOTOR ASSY, ZOOM	

Ref. No.	Part No.	Description	Remark
S001	1-572-986-11	SWTICH, ROTARY (ENCODER)	
S002	1-572-987-11	SWTICH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	
S005	1-570-771-21	SWITCH (C DOWN)	
W500	1-651-889-11	FP-48 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	
⚠W901	1-540-019-21	SOCKET ASSY, CRT	

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ACCESSORIES & PACKING MATERIALS

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Ref. No.	Part No.	Description	Remark
	1-467-574-21	REMOTE COMMANDER (RMT-708)(EXCEPT TR380)	
	1-574-039-11	CORD, CONNECTION (TR23/TR33) (A/V connecting cable (monaural), 1.5m)	
	1-770-371-11	ADAPTOR, CONVERSION (TR380:HK/TR460:HK)	
	3-798-694-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (TR380/TR380PK/TR460/TR460PK)	
	3-798-694-41	MANUAL, INSTRUCTION (CHINESE) (TR380/TR380PK/TR460/TR460PK)	
	3-798-695-21	MANUAL, INSTRUCTION (ENGLISH)(TR23/TR33)	
	3-798-695-31	MANUAL, INSTRUCTION (FRENCH) (TR23:CND/TR33:CND)	
	3-947-969-21	BELT (S), SHOULDER	
*	3-961-062-01	CUSHION (LOWER)(TR23/TR33/TR380/TR460)	
*	3-961-693-01	CUSHION, ACC (TR23/TR33/TR380/TR460)	
*	3-962-533-01	INDIVIDUAL CARTON (TR23)	
*	3-962-533-11	INDIVIDUAL CARTON (TR380)	
*	3-962-533-21	INDIVIDUAL CARTON (TR33)	
*	3-962-533-31	INDIVIDUAL CARTON (TR460)	
*	3-963-162-01	INDIVIDUAL CARTON (TR460PK)	
*	3-963-162-11	INDIVIDUAL CARTON (TR380PK)	
*	3-963-163-01	CUSHION (UPPER)(TR380PK/TR460PK)	
*	3-963-164-01	CUSHION (LOWER)(TR380PK/TR460PK)	
	3-963-674-01	CASE, CARRYING (TR380PK/TR460PK)	

** AC-V25A/V25B/V25C AC POWER ADAPTOR

*** NP-55 BATTERY PACK

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.

*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

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HARDWARE LIST

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Ref. No.	Part No.	Description	Remark
#1	7-627-553-47	PRECISION SCREW +P 2X4 TYPE 3	

Be sure to read "Note on the CCD Imager replacement" on page 4-5 when changing the CCD imager.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

1-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (DD-77 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ㉙ of CN901
Specified value	4.9 ± 0.1 Vdc
D3.6V check	
Measurement point	Pins ㉑ and ㉒ of CN901
Specified value	3.6 ± 0.1 Vdc
CAM 5V check	
Measurement point	Pins ㉕ and ㉖ of CN901
Specified value	4.85 ± 0.1 Vdc
CAM 15V check	
Measurement point	Pin ㉗ of CN901
Specified value	15 ± 0.3 Vdc
CAM –9V check	
Measurement point	Pin ㉛ of CN901
Specified value	$-8.5^{+0.25}_{-0.4}$ Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Set data: 01 to page: 6, address: 00.
2) Check that the data of page: 6, address: 11 is 00.
3) Set data: 2D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: 6, address: 11 is 01.
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote commander.
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

When the page F data is initialized, change the data by manual input.

Note 1: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

Note 2: When changing address: 00, set the data of page: 6, address: 00 to 80.

Address	Data
00	7C
01	0A
03	00
1C	0C
25	A5
2A	10
2B	40
2D	44
2E	17
2F	22
30	00
32	50
34	01
35	35
37	FD
38	63
50	13
54	66
57	66
58	59
5E	1E
60	3A
6E	02
74	02
77	F0
83	18

Table 6-1-4.

4. 28 MHz Original Oscillation Adjustment (VC-160 board)

Adjust the 28 MHz oscillation of the synchronization clock.
If the oscillation is not 28 MHz, the period will be inaccurate or the image will not be in color.

Subject	Not required
Measurement Point	Pin ⑧ of IC753 (JL708) (TP709)
Measuring Instrument	Frequency counter
Adjusting Element	CT701
Specified Value	14318181 ± 71 Hz

Adjusting method:

1) Use CT701 to adjust the oscillation frequency to 14318181 ± 71 Hz.

5. V SUB Adjustment

Set the CCD imager V SUB voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	04

Adjusting Method:

1) Read the V SUB voltage code of the CCD imager.
   Obtain the corresponding V SUB data from the following table.
2) Set data: 01 to page: 6, address: 00.
3) Set the V SUB data to page: F, address: 04.
4) Press the PAUSE button of the adjusting remote commander.

V SUB			V SUB		
Voltage Code	Data	Voltage (Vdc) *1	Voltage Code	Data	Voltage (Vdc) *1
e	71	9.0	q	AD	14.0
f	77	9.5	r	B3	14.5
g	7D	10.0	s	B9	15.0
h	83	10.5	t	BF	15.5
j	89	11.0	u	C5	16.0
k	8F	11.5	v	CB	16.5
l	95	12.0	w	D1	17.0
m	9B	12.5	x	D7	17.5
n	A1	13.0	y	DD	18.0
p	A7	13.5	z	E2	18.5

*1: The V SUB voltages (TP703) given are reference values.

6. VRG Adjustment

Set the CCD imager V RG voltage to the voltage specified for the imager.

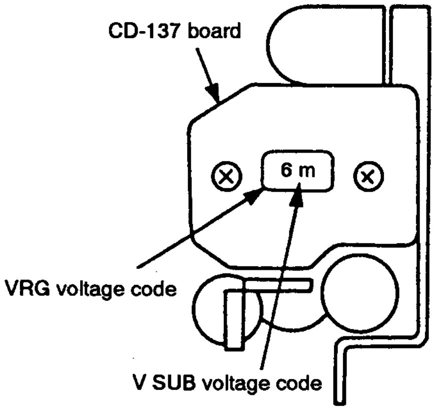
Subject	Not required
Adjustment Page	F
Adjustment Address	05

Adjusting Method:

1) Read the VRG voltage code of the CCD imager.
   Obtain the corresponding VRG data from the following table.
2) Set data: 01 to page: 6, address: 00.
3) Set the VRG data to page: F, address: 05.
4) Press the PAUSE button of the adjusting remote commander.

VRG		
Voltage Code	Data	Voltage (Vdc) *2
1	33	1.0
2	4E	1.5
3	69	2.0
4	84	2.5
5	9F	3.0
6	BA	3.5
7	D5	4.0

*2: The VRG voltages (TP707) given are reference values.



(Example) When "6m" is displayed:
The V SUB voltage code is "m" and therefore the V SUB data will be "9A".
The VRG voltage code is "6" and therefore the VRG data will be "BA".

Fig. 6-1-7.

7. HALL Adjustment

For detecting the position of the lens iris, adjust the hall AMP gain and hall offset.

Subject	Not required
Measurement Point	DDS display of LCD or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	06, 07
Specified Value	32 to 36 during IRIS OPEN B4 to B8 during IRIS CLOSE

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 01 to page: 1, address: 00.
3) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
4) Set data: 03 to page: 6, address: 02.
5) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 80 to page: F, address: 07, and press the PAUSE button of the adjusting remote commander.
7) Set data: 40 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
8) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and this data is named W_2.
9) Set data: 30 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
10) Read the DDS display data, and this data is named W_1.
11) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
12) Read the DDS display data, and this data is named K_1.
13) Set data: 40 to page: F, address: 06, and press the PAUSE button.
14) Read the DDS display data, and this data is named K_2.
15) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 6-1-3. "Hexadecimal notation-decimal notation conversion table".)
16) Calculate X_1' using the following equations (decimal notation calculation).

$$A' = W_2' + K_1' - W_1' - K_2' \cdots\cdots \text{Equation 1}$$

$$B' = W_1' - K_1' \cdots\cdots \text{Equation 2}$$

$$X_1' = \frac{2080 + (48 \times A') - (16 \times B')}{A'} \cdots\cdots \text{Equation 3}$$

17) Convert X_1' to hexadecimal notation, and obtain X_1. (Round off to one decimal place)
18) Set data: X_1 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
19) Change the data of page: F, address: 07, and adjust the DDS display data to "34".
20) Press the PAUSE button of the adjusting remote commander.
21) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
22) Read the DDS display data, and this data is named W_0. If W_0 lies within the "B4" to "B8" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
23) Convert W_0 to hexadecimal notation, and obtain W_0'.
24) Calculate X_2' using the following equations (decimal notation calculation).

$$C' = W_0' - B' - 52 \cdots\cdots \text{Equation 4}$$

$$X_2' = \frac{(130 - B') \times (X_1' - 48) + 48 \times C'}{C'} \cdots\cdots \text{Equation 5}$$

(X_1' and B' are values obtained from equations 2 and3)

25) Convert X_2' to hexadecimal notation and obtain X_2. (Round off to one decimal place)
26) Set data X_2 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
27) Change the data of page: F, address: 07, and adjust the DDS display data to "B6".
28) Press the PAUSE button of the adjusting remote commander.
29) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
30) Check that the DDS display data lies within the "32" to "36" range.

Processing after Completing Adjustments

1) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
3) Set data: 00 to page: 1, address: 00.

8. Flange Back Adjustment

The flange back adjustment for the inner focus lens is performed automatically.

Subject	Chart for flange back adjustment (2000 ± 5 mm from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	16, 17, 18, 19, 1A, 1B

Adjusting method:

1) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
2) Set data: 01 to page: 6, address: 00.
3) Check that the data of page: 6, address: 21 is 00.
4) Check that the page: F, address: 16 to 1B data is at the initial value. (Refer to Table 6-1-2. "Page F address list")
5) Set data: 13 to page: 6, address: 01 and press the PAUSE button of the adjusting remote commander.
6) Set data: 15 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (The adjustment data is automatically input to page: F, addresses: 16 to 1B.)
7) Check that the data of page: 6, address: 21 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Turn off the main power supply (6.3V).

9. Flange Back Check

Subject	Siemens star (2m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	Focused at the TELE end and WIDE end.

Checking method:

1) Place the Siemens star 2m from the front of the lens.
2) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
3) Shoot the siemens star with the zoom TELE end.
4) Check that the lens is focused. (Note 2)
5) Set data: 01 to page: 6, address: 25.
6) Shoot the siemens star with the zoom WIDE end.
7) Check that the lens is focused.

Note: When the auto focus is ON, the lens can be checked if it is focused or not by observing the data on page A of the adjusting remote commander.

1) Set data: 0C to page: 6, address: 02.
2) Page A shows the state of the focus.

A : 00 : XX → (Odd: Focused
Even: Unfocused)

Processing after compleating adjustments

1) Set data: 00 to page: 6, address: 02.
2) Set data: 00 to page: 6, address: 25.

10. Picture Frame Setting

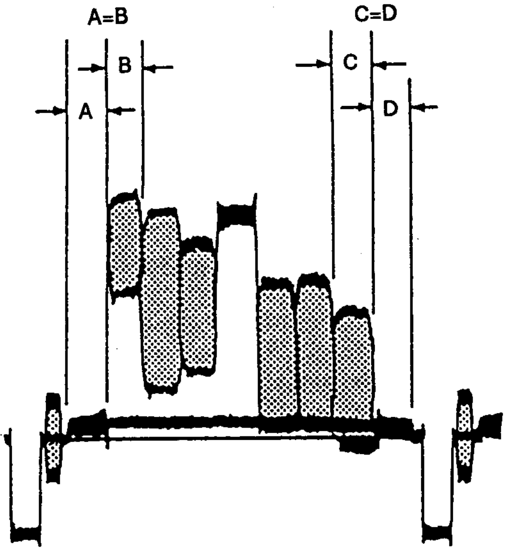
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Adjust the zoom and the camera direction, and set to the specified position.
2) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

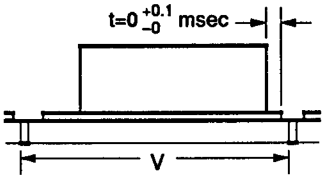

$t=0^{+0.1}_{-0}$ msec
V

Fig. 6-1-8.

Check on the TV monitor

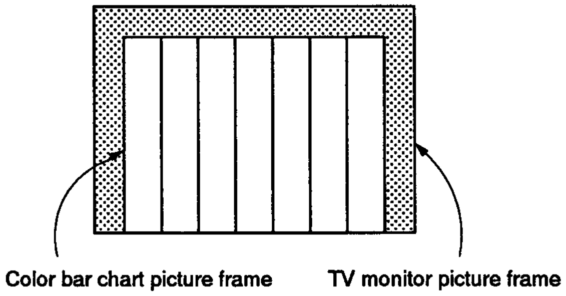

Color bar chart picture frame
TV monitor picture frame

Fig. 6-1-9.

11. Color Reproduction Adjustment

Adjust the color separation matrix coefficient so that the proper color reproduction is produced.

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	08, 09, 0A, 0B
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 00 to page: 6, address: 03.
3) Set data: F1 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
4) Set data: 02 to page: F, address: 50, and press the PAUSE button of the adjusting remote commander.
5) Set data: C6 to page: F, address: 63, and press the PAUSE button of the adjusting remote commander.
6) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
7) Change the data of addresses 08, 09, 0A and 0B of page: F, and settle each color luminance point in each color reproduction frame.

   Note 1: Be sure to press the PAUSE button of the adjusting remote commander before changing the addresses.

   If not, the new data will not be written to the memory.
8) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: E0 to page: F, address: 10 and press the PAUSE button of the adjusting remote commander.
2) Set data: 13 to page: F, address: 50, and press the PAUSE button of the adjusting remote commander.
3) Set data: 26 to page: F, address: 63, and press the PAUSE button of the adjusting remote commander.
4) Set data: 10 to page: 6, address: 03.

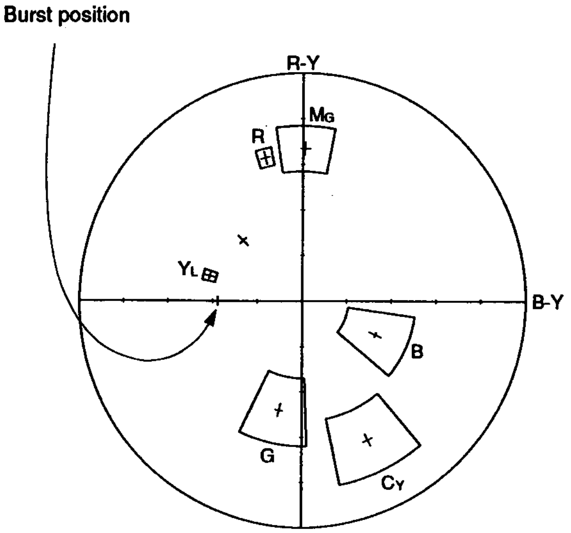


Fig. 6-1-10.

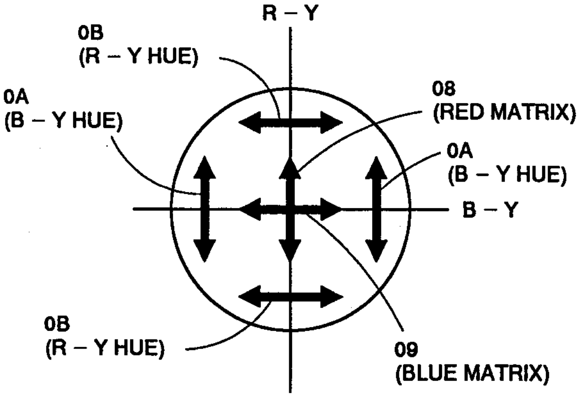


Fig. 6-1-11. Direction of the Movements of the Adjustment Address and Luminance Point

12. IRIS IN/OUT Adjustment

For the unit to judge if the white balance is indoors or outdoors, measure the light level and write it in the EEPROM.
If the level is not correct, the white balance will not be accurate.

Subject	White pattern
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	13, 14

Adjusting method:

1) Set data: 01 to page: 6, address: 00
2) Set data: 01 to page: 1, address: 00
3) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
4) Set data: 0E to page: 6, address: 02.
5) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Read the DDS display data (Note 1), and take the upper two digits as D_1 and the lower two as D_2.
7) Convert D_1 to a decimal number and obtain D_1'. (Refer to Table 6-1-3. "Hexadecimal Notation-Decimal Notation Conversion Table".)
8) Calculate D_3' using the following equations.
   (Equations 1 and 2 are for decimal notation calculation)
   When $D_2 \geqq D0$
   $D_3' = D_1' - 21$ ································· Equation 1
   When $D_2 < D0$
   $D_3' = D_1' - 22$ ································· Equation 2
9) Convert D_3' to a hexadecimal number and obtain D_3.
10) Set D_3 to page: F, address: 13, and press the PAUSE button of the adjusting remote commander.
11) Set data: 09 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
12) Read the DDS display data (Note 1), and take the upper two digits as D_4 and the lower two as D_5.
13) Convert D_4 to a decimal number and obtain D_4'. (Refer to Table 6-1-3. "Hexadecimal Notation-Decimal Notation Conversion Table".)
14) Calculate D_6' using the following equations.
   (Equations 3 and 4 are for decimal notation calculation)
   When $D_5 \geqq F0$
   $D_6' = D_4' - 13$ ······································ Equation 3
   When $D_5 < F0$
   $D_6' = D_4' - 14$ ······································ Equation 4
15) Convert D_6' to a hexadecimal number and obtain D_6.
16) Set D_6 to page: F, address: 14, and press the PAUSE button of the adjusting remote commander.

Note 1: The right four digits of the display data at the right bottom side of the EVF and monitor TV is the LIGHT LEVEL data. If the lower digits change severely and cannot be read, record it on a tape once, play it back by frame feeding, and obtain the average value.

Processing after Completing Adjustments

1) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 1, address: 00.
3) Set data: 00 to page: 6, address: 00, and press the PAUSE button of the adjusting remote commander.
4) Set data: 00 to page: 6, address: 02.

13. MAX GAIN Adjustment

Setting the minimum illumination.
If it is not consistent, the image level required for taking subjects in low illuminance will not be produced (dark).

Subject	White pattern standard picture frame
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	15
Specified Value	C4 to CC

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 01 to page: 1, address: 00.
3) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
4) Set data: 01 to page: 2, address: 00.
5) Set data: 01 to page: 2, address: 42.
6) Set data: 5A to page: 2, address: 40.
7) Set data: 54 to page: 2, address: 41.
8) Set data: 01 to page: 6, address: 02.
9) Set data: 19 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
10) Change the data of page: F, address: 15 and adjust so that the DDS display data lies within the "C4" to "CC".
11) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 1, address: 00.
3) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Set data: 00 to page: 6, address: 02.
5) Set data: 01 to page: 2, address: 00.
6) Set data: 00 to page: 2, address: 40.
7) Set data: 00 to page: 2, address: 41.
8) Set data: 00 to page: 2, address: 42.
9) Set data: 00 to page: 2, address: 00.

14. Auto White Balance Standard Data Input

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	0C, 0D, 0E, 0F

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Set data: 01 to page: 6, address: 00.
3) Check that the data of page: 6, address: 11 is 00.
4) Check that the data of page: 6, address: 03 is 10.
5) Wait for 2 seconds.
6) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
7) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (When the standard data is taken in, the data will be automatically input to addresses 0C to 0F of page F.)
8) Check that the data of page: 6, address: 11 is 01.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

15. Auto White Balance Adjustment

Adjust to the proper auto white balance output data.
If it is not correct, auto white balance and color reproducibility will be poor.

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	11, 12
Specified Value	R ratio: 2A40 to 2AC0 B ratio: 5E00 to 5F00

Adjusting method:

1) Place the C14 filter for color temperature correction on the lens.
2) Set data: 01 to page: 1, address: 00.
3) Set data: 21 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
4) Set data: 01 to page: 6, address: 00.
5) Set data: D0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
6) Set data: 04 to page: 6, address: 02.
7) Change the data of page: F, address: 11, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to the R ratio specified value.
8) Press the PAUSE button of the adjusting remote commander.
9) Set data: 05 to page: 6, address: 02.
10) Change the data of page: F, address: 12, and adjust the average value of the DDS display data to the B ratio specified value.
11) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: E0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
3) Set data: 00 to page: 6, address: 02.
4) Set data: 00 to page: 1, address: 00.

16. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 6-1-12. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 01 to page: 6, address: 00.
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Check that the center of the white luminance point is within the circle shown in Fig. 6-1-12.A.
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 23 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
7) Place the C14 filter on the lens.
8) Check that the center of the white luminance point settles in the circle shown in Fig. 6-1-12. B.
9) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
10) Check that the center of the white luminance point settles in the circle shown in Fig. 6-1-12. C.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 00, and press the PAUSE button.

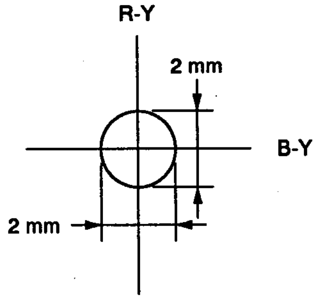


Fig. 6-1-12. A

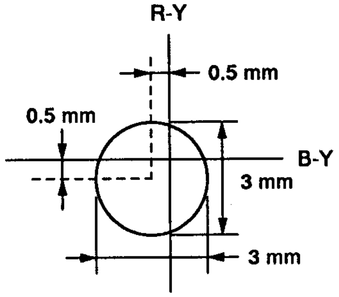


Fig. 6-1-12. B

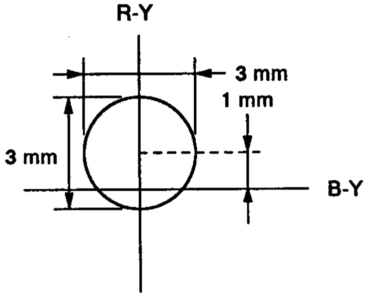


Fig. 6-1-12. C

17. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=680 ± 40 mV SYNC level=285 ± 20 mV BURST level=285 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

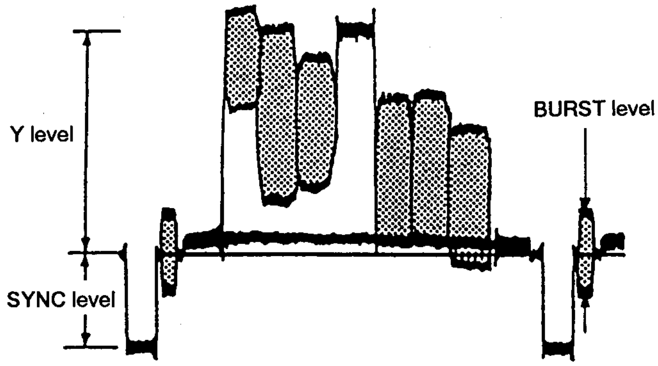


Fig. 6-1-13.

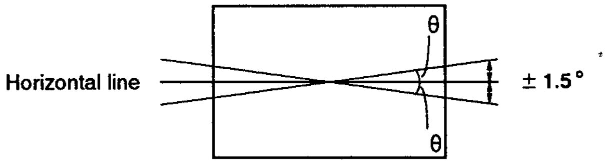
1-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENTS (CCD-TR23/TR380)

1-3-1. Horizontal Slant Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Specified Value	± 1.5°

Adjusting method:

1) Adjust RV904 (BRIGHT) so that the CRT can be seen easily and clearly.
2) Loosen the DY (deflection yoke) tightening screw.
3) Rotate DY, and adjust the image so that it is horizontal.
4) Tighten the DY tightening nut.
   (Do not tighten it too tightly.)



Specified value: The image should be within ± 1.5° of the horizontal line.

Fig. 6-1-14.

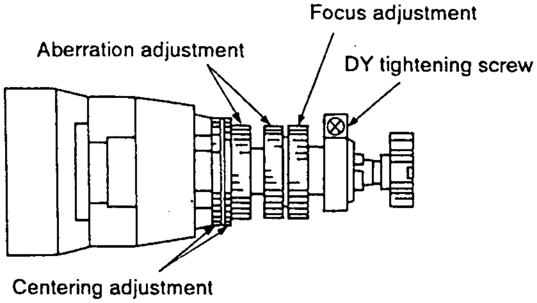


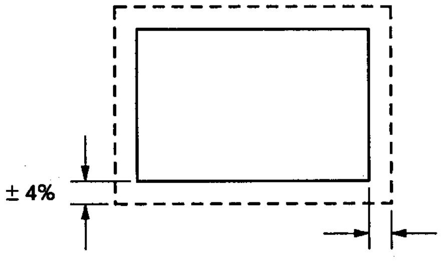
Fig. 6-1-15.

1-3-2. Centering Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Specified Value	± 4%

Adjusting method:

1) Use the centering adjustment ring and adjust so that the left, right, top, and bottom sides of the display are uniform. (Refer to Fig. 6-1-15.)
   Note: As the centering position changes due to earth magnetism, rotate it 360 ° in the horizontal direction, and adjust with the center section of the modifying position.



Adjustment value: ± 4%

Fig. 6-1-16.

1-3-3. Focus Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section

Adjusting method:

1) Adjust the focus ring to obtain the optimum focus.
   (Refer to Fig. 6-1-15.)

1-3-4. Aberration Adjustment

Model	E-E
Signal	Dot pattern
Specified Value	T < 2 • D, F < D

Adjusting method:

1) Adjust the aberration adjustment ring so that the tracing of the dot becomes less than twice the diameter of the dot, or the fan aberration becomes less than the diameter of the dot.
2) If the centering becomes displaced here, perform the centering adjustment from the beginning again.

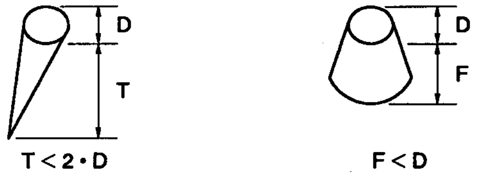


Fig. 6-1-17.

1-3-5. Horizontal Amplitude Adjustment (VF-65 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	C909
Specified Value	6 ± 2%

Adjusting method:

1) Rotate RV903, and adjust the top and bottom sides of the monoscope image to the top and bottom edges of the display.
2) Rotate RV904 so that the brightness is the normal level.
3) Adjust the pattern (A) of the H size adjustment capacitor (C909) to "short" or "open", so that the horizontal direction over scan becomes 6 ± 2% (Left and right totals). (Refer to Fig. 6-1-19.)

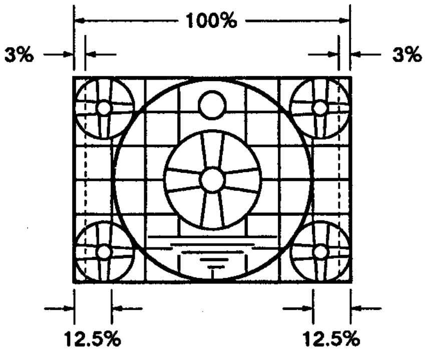
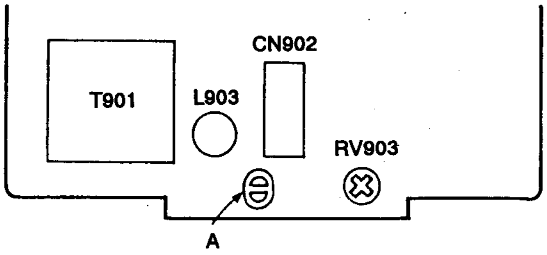


Fig. 6-1-18.



VF-65 board (Component side)

Section A	Size H
Open	Small
Short	Big

Fig. 6-1-19.

1-3-6. Vertical Amplitude Adjustment (VF-65 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	RV903
Specified Value	5 ± 2%

Adjusting method:

1) Adjust RV903 so that the vertical direction over scan becomes 5 ± 2% (Top and bottom totals).

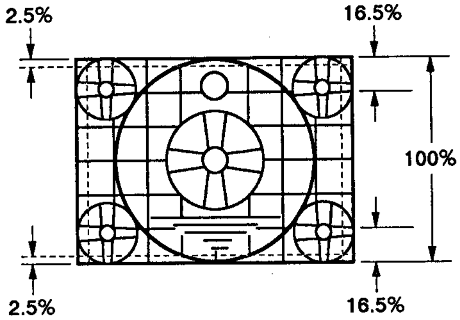


Fig. 6-1-20.

1-3-7. Brightness Adjustments (VF-65 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	RV904

Adjusting method:

1) Rotate RV904, and adjust so that the bright/dark sections of the gray scale are displayed correctly. (The bright section should be unsatisfactory till the cross hatch appears vague in the monoscope circle. The dark section should be unsatisfactory till the darkest section and the second darkest section of the gray scale cannot be differentiated.)

1-3-8. Horizontal Amplitude, Vertical Amplitude, Focus Check

"1-3-5. Horizontal Amplitude Adjustment" and "1-3-6. Vertical Amplitude Adjustment" should both satisfy the specified values. If not, perform the adjustments from the beginning again. In this case, perform [1-3-7. Brightness, Contrast Adjustments] again. Moreover, check the focus, and if it found to be vague, perform "1-3-3. Focus Adjustment" and "1-3-4. Aberration Adjustment".

1-4. COLOR ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENTS (CCD-TR33/TR460)

Note 1: The backlight (fluorescent tube) is driven by a 800 Vp-p, 16 kHz AC power supply.
Therefore, be careful not to touch the backlight holder as you will receive an electric shock.

Note 2: When replacing the LCD unit, ensure there will be no damages by static electricity.

[Adjusting connector]

Some measuring points for adjusting the view-finder are concentrated at CN902 of the VF-67 board. Connect the measuring equipments via the measuring pin tool. The following table lists the pin numbers and signal names of CN902.

Pin No.	Signal Name	Pin No.	Signal Name
1	LC COM	2	EVF GND
3	G OUT	4	13.5V
5	NC	6	12V
7	R OUT	8	B OUT
9	NC	10	PCO

Table 6-1-5.

[Power Supply Voltage]

Adjust the power supply voltage for the battery pin so that Pin ⑦ (EVF UNREG) of CN851 of the VF-66 board becomes 6.0 ± 0.1 Vdc.

[Video Input Signal for Adjusting]

If the signal column specifies "Color bar signal whose chroma signal and burst signal are turned off", input a color bar signal whose chroma signal and burst signal have been turned off to the video input pin as the video input signal for adjusting. Check that the signal level of Pin ⑪ of CN851 of the VF-66 board is 1.0 ± 0.12 Vp-p before adjusting.

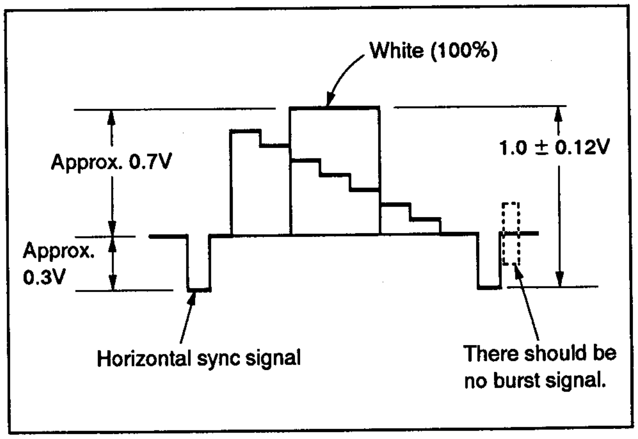


Fig. 6-1-21. Color bar signal whose chroma signal and burst signals are turned off

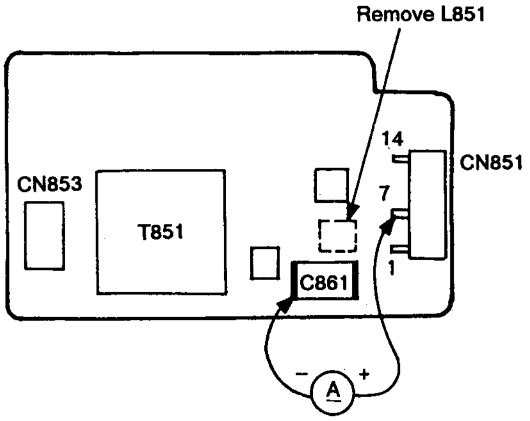
1. Current Consumption Adjustment (VF-66 board)

Adjust the luminance and color temperature of the back light.
If these are not correct, the image will be brighter or darker than normal.

Mode	Stop
Signal	Color bar signal whose chroma signal and burst signal are turned off
Measurement Point	Remove L851 and measure + : Pin ⑦ of CN851 – : ⊕ pin of C861
Measuring Instrument	Ammeter
Adjustment Page	D
Adjustment Address	B7
Specified Value	55 ± 5 mA

Note 1: Wait for 30 secs. after the power supply has been turned on before this adjustment.
Note 2: After adjusting, connect L851.

Adjusting method:
1) Check that the voltage of Pin ⑦ of CN851 is 6.0 ± 0.1 Vdc.
2) Set data: 01 to page: 1, address: 00.
3) Change the data of page: D, address: B7, and adjust the current consumption to 55 ± 5 mA.
4) Press the PAUSE button of the adjusting remote commander.



VF-66 BOARD Component side

Fig. 6-1-22.

2. Power Supply Voltage Check (VF-67 board)

Mode	Record
Measuring Instrument	Digital voltmeter
13.5V check	
Measurement Point	Pin ⑭ of CN901
Specified Value	13.5 ± 0.3 Vdc
12.0V check	
Measurement Point	Pin ⑬ of CN901
Specified Value	12.0 ± 0.3 Vdc

3. EVR Initial Data Input

Mode	STOP
Signal	Arbitary
Adjustment Page	D

Adjusting method:
1) Set data: 01 to page: 1, address: 00.
2) Select page D, and input the data in the following table.
Note: To write in the nonvolatile memory (EEPROM), press the PAUSE button of the adjusting remote commander each time the data is set.

Address	Data
B0	A0
B1	AE
B2	95
B3	7A
B4	6A
B5	70
B6	90
B7	35
B8	7A
B9	7A
BA	70
BB	F0

4. VCO Adjustment (VF-67 board)

Set the free running frequency of the VCO.
If it is not correct, the image will waver.

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑩ of CN902 (PCO)
Measuring Instrument	Oscilloscope (DC range)
Adjustment Page	D
Adjustment Address	B6
Specified Value	A=2.8 ± 0.1V

Adjusting method:

1) Check tha GND level of the oscilloscope.
2) Set data: 01 to page: 1, address: 00.
3) Change the data of page: D, address: B6, and adjust the PCO voltage (A) to the specified value.
4) Press the PAUSE button of the adjusting remote commander.

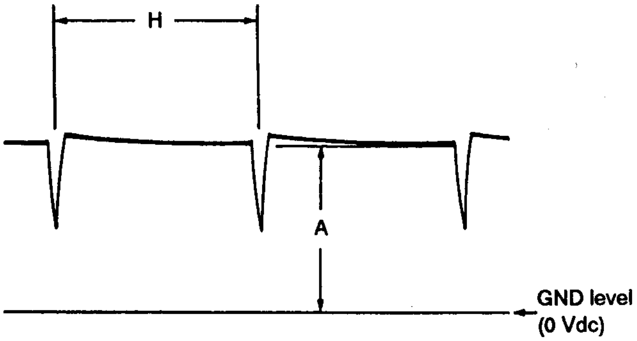


Fig. 6-1-23.

5. Bright Adjustment (VF-67 board)

Adjust to the proper LCD panel driving video signal level.
If it is not correct, the image will be saturated (whitish) or blackish.

Mode	Record
Signal	No signal
Measurement Point	Pin ③ of CN902 (G OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	B0
Specified Value	A=7.0 ± 0.1V

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: B0, and adjust the potential difference (A) between the reversed waveform pedestal and the non reversed waveform pedestal to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

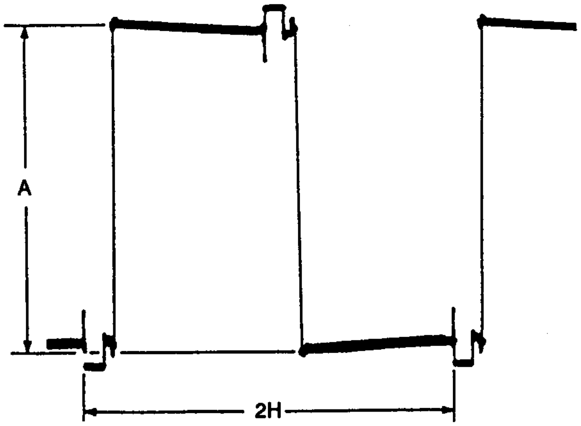


Fig. 6-1-24.

6. Contrast Adjustment (VF-67 board)

Set the contrast of the image.

If the contrast is not correct, the image will be blur (whitish) or saturated.

Mode	Record
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	Pin ③ of CN902 (G OUT)
Measuring Instrument	Oscilloscope External trigger: Pin ㉞ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	B5
Specified Value	A=2.0 ± 0.1V

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: B5, and adjust the voltage (A) between the white (100%) and pedestal to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

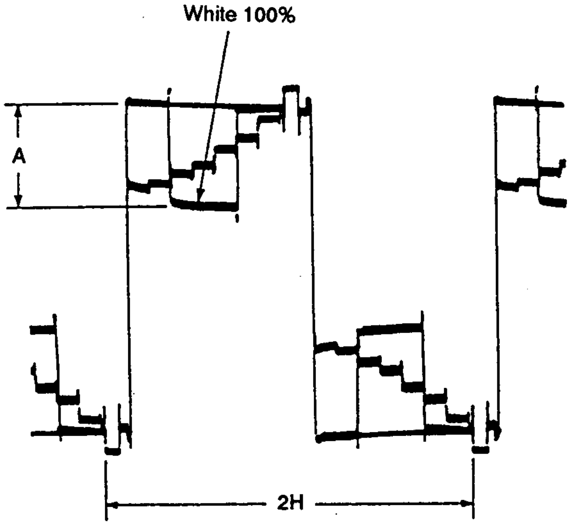


Fig. 6-1-25.

7. SUB BRIGHT R Preset Adjustment (1) (VF-67 board)

White balance rough adjustment (1)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑦ of CN902 (R OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	B3
Specified Value	A=7.0 ± 0.1V

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: B3 and adjust the potential difference (A) between the reversed waveform pedestal and the non reversed waveform pedestal to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

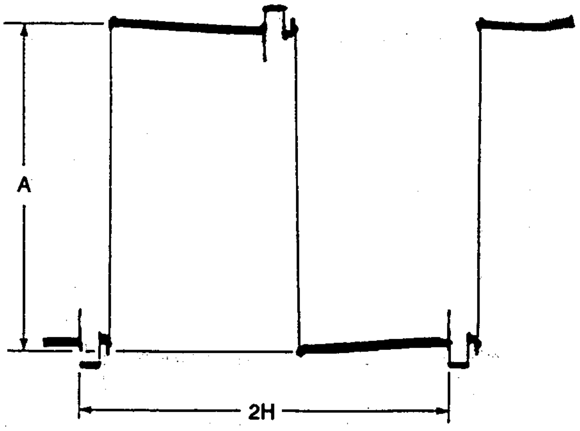


Fig. 6-1-26.

8. SUB BRIGHT B Preset Adjustment (2) (VF-67 board)

White balance rough adjustment (2)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of CN902 (B OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	B4
Specified Value	A=7.1 ± 0.1V

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: B4 and adjust the potential difference (A) between the reversed waveform pedestal and the non reversed waveform pedestal to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

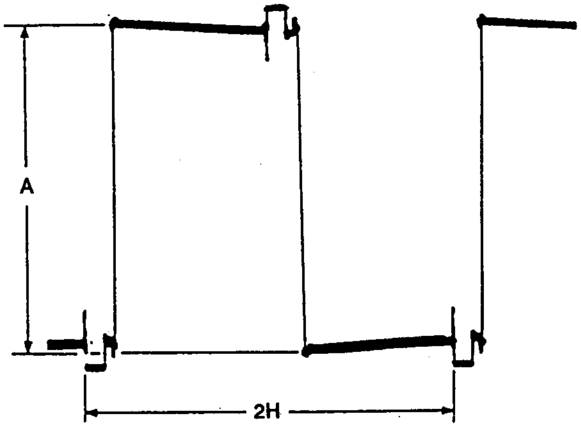


Fig. 6-1-27.

9. White Balance Adjustment

Adjust to the proper white balance level.

If it is not correct, the color reproducibility of the LCD panel will be poor.

Mode	Record
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	Check on the LCD display
Measuring Instrument	
Adjustment Page	D
Adjustment Address	B3, B4
Specified Value	The display should not be colored

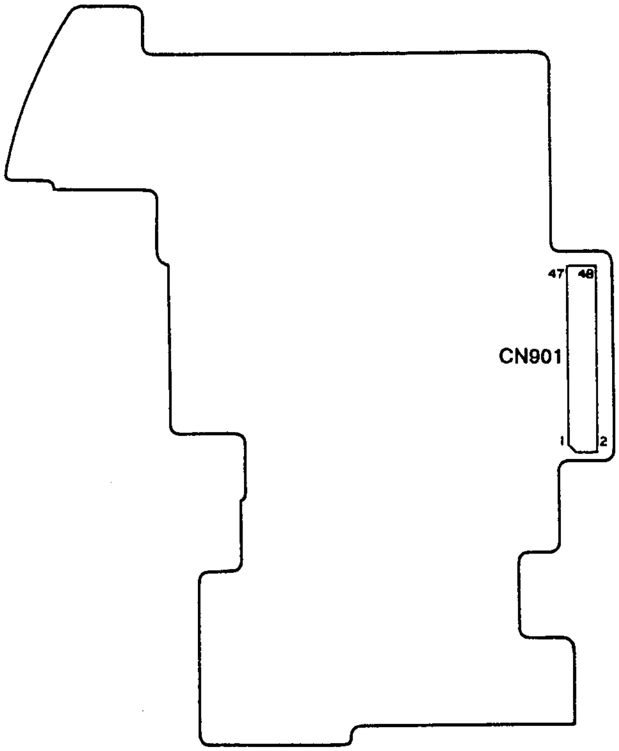
Note: Wait for more than 1 minute after the power supply has been turned on before this adjustment.

Adjusting method:

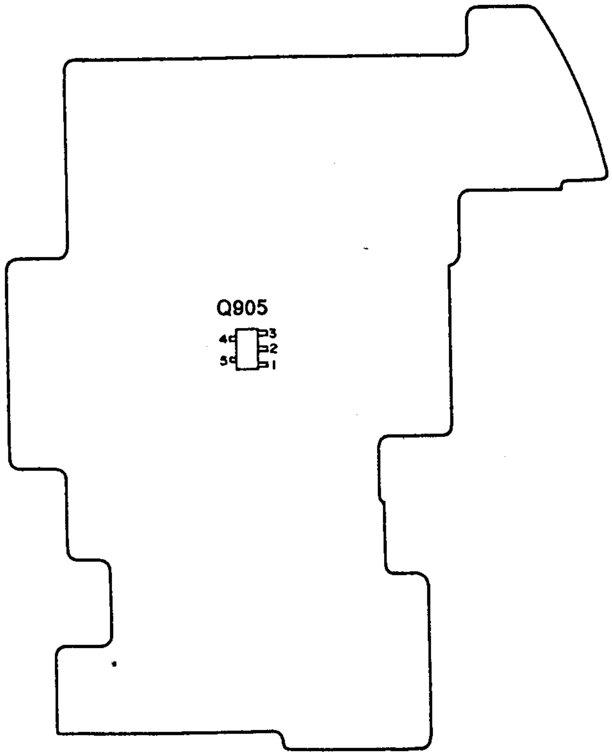
1) Set data: 01 to page: 1, address: 00.
2) Check that the LCD display is not colored. If it is, change the data of address: B3 and address: B4 of page: D, and adjustment the display is not colored.
3) Press the PAUSE button of the adjusting remote commander.

1-5. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

DD-77 BOARD (CONDUCTOR SIDE)

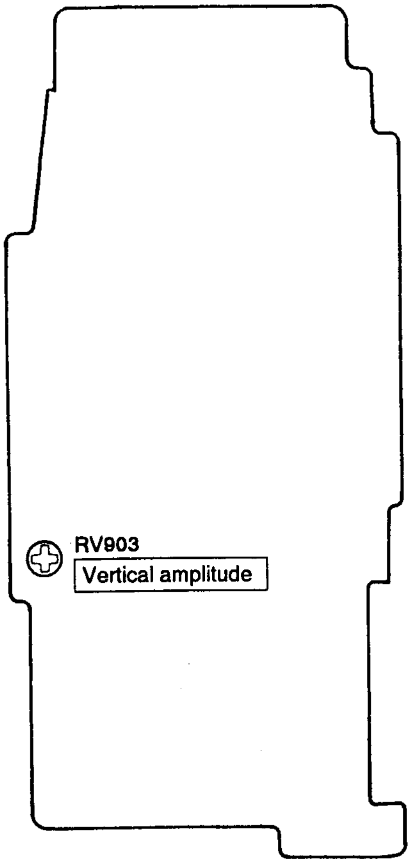

47
48
CN901
1
2

DD-77 BOARD (COMPONENT SIDE)

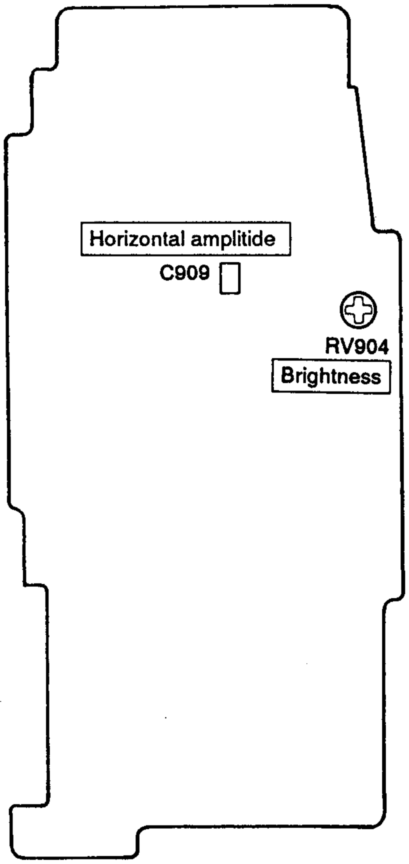


CCD-TR23/TR380

VF-65 BOARD (COMPONENT SIDE)

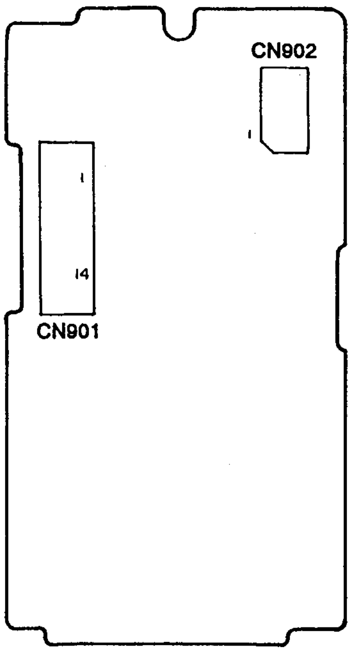

RV903
Vertical amplitude

VF-65 BOARD (CONDUCTOR SIDE)

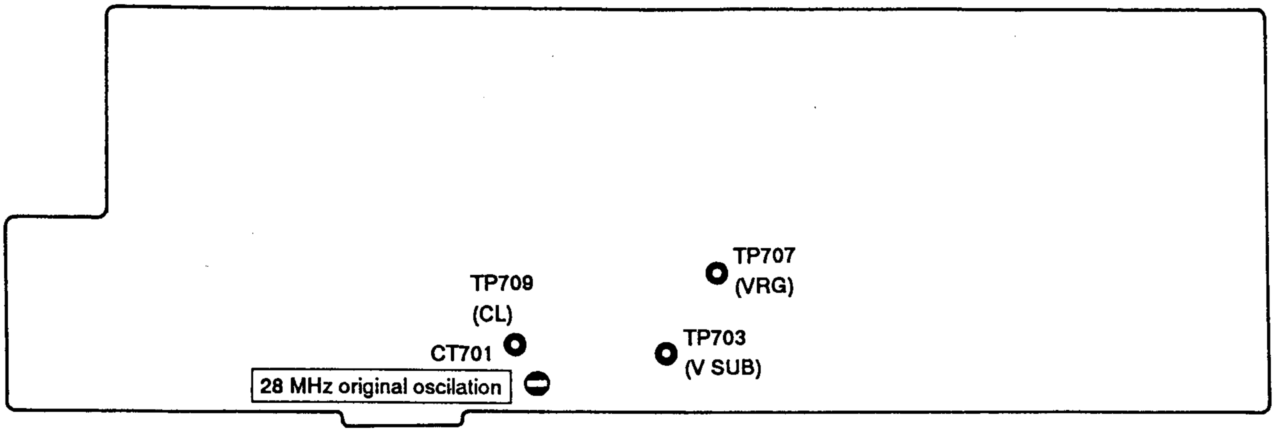

Horizontal amplitide
C909
RV904
Brightness

CCD-TR33/TR460

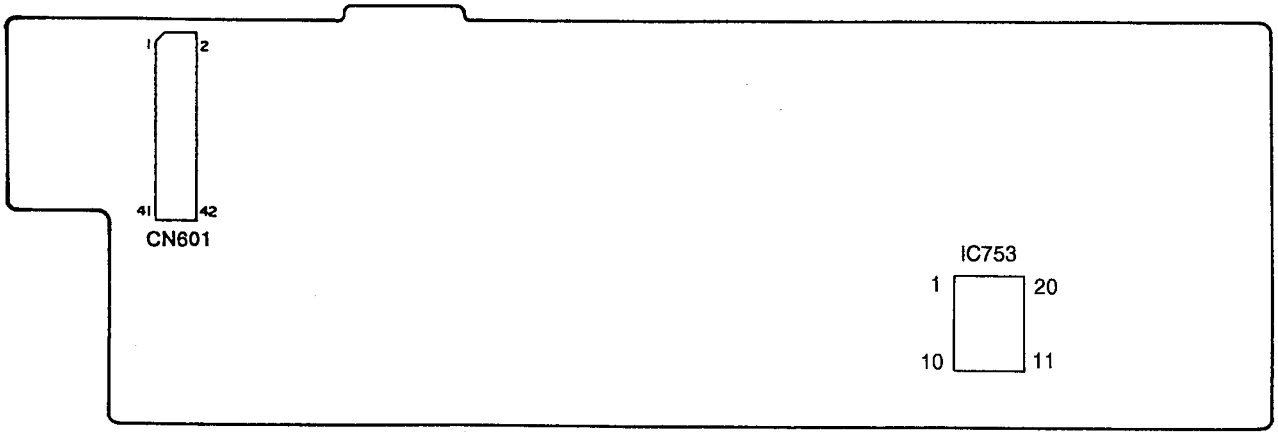
VF-67 BOARD (COMPONENT SIDE)


CN902
1
1
14
CN901

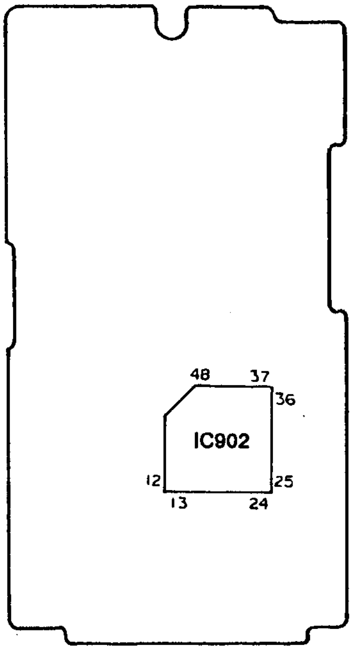
VC-160 BOARD (COMPONENT SIDE)


TP707
(VRG)
TP709
(CL)
CT701
TP703
(V SUB)
28 MHz original oscilation

VC-160 BOARD (CONDUCTOR SIDE)


1
2
41
42
CN601
IC753
1
20
10
11

VF-67 BOARD
(CONDUCTOR SIDE)


48
37
36
IC902
12
25
13
24

6-2. MECHANICAL SECTION ADJUSTMENTS

Mechanism Parts Adjustments

For details on the adjustments and checks of mechanical section and replacements of mechanism parts, refer to the separate volume-"8 mm Video Mechanism Adjustment Manual IV A Mechanism ".

2-1. OPERATING WITHOUT A CASSETTE

1) Refer to "2. DISASSEMBLY" and supply the power with the cabinet removed. (So that the mechanical deck can be operated.)
2) Connect the adjusting remote commander to the remote terminal.
3) Turn on the HOLD switch of the adjusting remote commander.
4) Close the cassette compartment without loading a cassette and complete loading.
5) Set data: 01 to page: 1, address: 00.
6) Set data: 01 to page: D, address: 02, and press the PAUSE button of the adjusting remote commander.
7) Set data: 04 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.

By carrying out the above procedure, the unit can be operated without loading a cassette.
Be sure to carry out "Processing after Operations" after checking the operations.
Set the data of page: D, address: 03 to the following if the sensor ineffective mode, forced VTR power supply ON mode or forced camera power supply ON mode are to be used together.

Forced VTR power supply ON mode ········· 06
Forced camera power supply ON mode ······ 05

[Processing after Operations]

1) Set data: 01 to page: 1, address: 00.
2) Set data: 00 to page D, address: 02, and press the PAUSE button of the adjusting remote commander.
3) Set data: 00 to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
4) Set data: 00 to page: 1, address: 00.
5) Disconnect the power supply of the unit.

2-2. TAPE PATH ADJUSTMENT

1. Preparations for adjustments

1) Clean the tape path face (tape guide, drum, capstan shaft, pinch roller).
2) Connect the adjusting remote commander to the remote terminal.
3) Turn on the HOLD switch of the adjusting remote commander.
4) Select page: 1, address: 00, and set data: 01.
5) Select page: D, address: 02, and set data: 03.
   (Perform "Processing after operations" after completing adjustments.)
6) Connect the oscilloscope.
   Channel 1-Pin ③ of CN102 of VS-124 board
   External trigger-Pin ④ of CN102 of VS-124 board
   (Connect the oscilloscope via the measuring pin tool for the video section (J-6082-140-A).)
7) Playback the alignment tape (WR5-1NP) for tracking.
8) Check that the RF waveform of the oscilloscope is flat at both the entrance and the exit.
   If not flat, perform necessary adjustment according to the separate 8 mm Video Mechanical Adjustment Manual IV (A Mechanism).
9) Perform "Processing after operations", after completing adjustments.

CN102 of VS-124 board

1	PB CH RF
2	PB PCM RF
3	PB RF
4	RF SWP
5	RP GND
6	REC 2

[Processing after operations]

1) Connect the adjusting remote commander, and turn on the HOLD switch.
2) Select page: 1, address: 00, and set data: 01.
3) Select page: D, address: 02, and set data: 00.
4) Press the PAUSE button of the adjusting remote commander.
5) Remove the power supply from the unit.

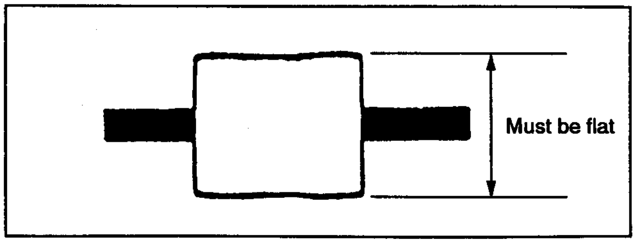


Fig. 6-2-1.

6-3. VIDEO SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 6–62.

3-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

3-1-1. Equipments to be Used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)
    Part Code: 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)
    Part Code: 8-967-995-12
    For checking operations
    (WR5-4NL)^Note 1
    Part Code: 8-967-995-51
    (WR5-5NSP)^Note 2
    Part Code: 8-967-995-42
    Note: The following alignment tapes can also be used.
    1) WR5-3NL (8-967-995-31)
    2) WR5-4NSP (8-967-995-41)
12) Remote commander for adjustment (J-6082-053-B)
13) VC-160 board extension cord (42P, 0.8 mm)
    Part Code: J-6082-285-A
14) Control switch block (FK board) extension cord (9P, 0.8 mm)
    Part Code: J-6082-288-A
15) Control switch block (CK board) extension cord (18P, 0.8 mm)
    Part Code: J-6082-289-A

3-1-2. Adjusting Precautions

1) The adjustment for this unit is performed using the VIDEO input (VIDEO terminal input) or the camera input. The camera input can be used for video adjustments only. Use the VIDEO input for the other adjustments.
   When using the VIDEO input, set the power supply switch to "PLAYER" or set the "forcible VTR power supply ON mode" using the adjusting remote commander. (Note 1).
   When using the camera input, set the power supply switch to "CAMERA" or set the "Forcible camera+VTR power supply ON mode" using the adjusting remote commander (Note 2).
   After completing adjustments, be sure to exit the "forcible VTR power supply ON mode" or "forcible camera+VTR power supply ON mode" (Note 3).
2) The F panel block (MA-231 board) is not used for video adjustments. Disconnect the following connector in these adjustments.
   1. CN402 of the AU-183 board (8P, 0.8 mm)
3) AU-183 board is required only for audio adjustments. When not using it, disconnect the following connector.
   1. CN202 of the VS-124 board (24P, 0.8 mm)
4) The view finder (VF board) is not used for video adjustments. Disconnect the following connector in these adjustments.
   1. CN206 of the VS-124 board
5) The cabinet (R) (CK board: Power supply switch, camera function switch) need not be connected if the "forcible VTR power supply ON mode" or "forcible camera+VTR power supply ON mode" is set. In this case, disconnect the following connectors.
   1. CN503 of the VS-124 board (18P, 0.8 mm)
   2. CN101 of the ZB-2 board (4P, 0.8 mm)
   However, as disconnecting these connectors means disconnecting the 3V lithium power supply, data set by the user such as the date, time, and menu will be lost. After completing the adjustments, set these data again, and be sure to exit the "forcible VTR power supply ON mode" or "forcible camera+VTR power supply ON mode". (Note 3)
   When connecting the cabinet (R) using the extension cord, use the following type.
   1. J-6080-289-A (18P, 0.8 mm)

6) The lens block and VC-160 board are not used for video adjustments. Disconnect the following connectors in these adjustments.
   1. CN203 of the VS-124 board (42P, 0.8 mm)

   Connect the following when removing the VC-160 board.
   1. Connect Pin ㉒ (REG H) and Pin ⑦ (D3.6V) of CN203 of the VS-124 board with a jumper wire.

   When connecting the VC-160 board using the extension cord, use the following type.
   1. J-6080-285-A (42P, 0.8 mm)
7) The audio board (AU-183 board) is required only for audio adjustments. When not using it, disconnect the following connector.
   1. CN202 of the VS-124 board (24P, 0.8 mm)
8) When opening the VS-124 board, disconnect the following connectors.
   1. CN502 of the VS-124 board (9P, 0.8 mm)

   The VTR function keys will not work. Use the remote commander to perform operations other than EJECT.

   When connecting the FK board and CN502 of VS-124 board using the extension cord, use the following type.
   1. J-6080-288-A (9P, 0.8 mm)

Note 1: Setting the "forcible VTR power supply ON mode (VIDEO input mode)"
1) Set data: 01 to page: 1, address: 00.
2) Set data: 02 to page: D, address: 03 and press the PAUSE button of the adjusting remote commander.

By performing the above, the VTR can be operated with the cabinet (R) removed. After completing adjustments, be sure to exit the "forcible power supply ON mode".

Note 2: Setting the "forcible camera+VTR power supply ON mode (camera input mode)"
1) Set data: 01 to page: 1, address: 00.
2) Set data: 03 to page: D, address: 03 and press the PAUSE button of the adjusting remote commander.

By performing the above, the VTR can be operated with the cabinet (R) removed. After completing adjustments, be sure to exit the "forcible power supply ON mode".

Note 3: Exiting the "forcible power supply ON mode"
1) Set data: 01 to page: 1, address: 00.
2) Set data: 00 to page: D, address: 03 and press the PAUSE button of the adjusting remote commander.
3) Set data: 00 to page: 1, address: 00.

3-1-3. Connecting the Equipments

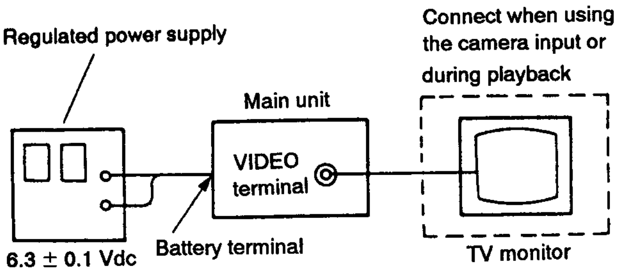
Connect the measuring instruments as shown in Fig. 6-3-1. according to the input terminal specifications (VIDEO input or CAMERA input), and perform the adjustments.

The input terminal is specified in the ( ) in the signal column. Either input terminal can be used when there are no specifications.

Note 1: If the VIDEO input is used for the adjustments which specify for the CAMERA input to be used, the product specifications of the unit may not be satisfied in some cases. Be sure to perform according to the specifications.

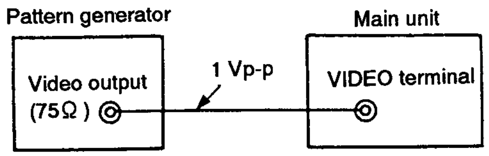
Note 2: When adjustments are performed with the S video output terminal VTR as the signal source, the efficiencies of the unit may be affected by VTR. It is recommendet that a pattern generator with a Y/C separation output terminal be used as much as possible.

Connecting the TV monitor and regulated power supply


Regulated power supply
Connect when using the camera input or during playback
Main unit
VIDEO terminal
6.3 ± 0.1 Vdc
Battery terminal
TV monitor

Connecting the pattern generator

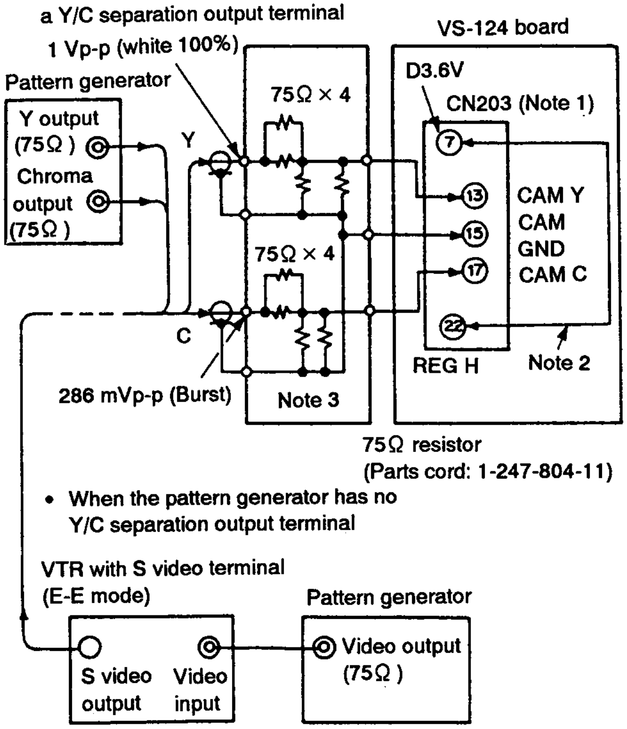
[VIDEO Input]
Set the power supply switch to "PLAYER" or set the "forcible VTR power supply ON mode" using the adjusting remote commander.


Pattern generator
Main unit
Video output
(75Ω)
1 Vp-p
VIDEO terminal

Note: The TV monitor cannot be connected.
Use the view finder to monitor.

[CAMERA Input]
Set the power supply switch to "CAMERA" or set the "forcible camera+VTR power supply ON mode" using the adjusting remote commander.

- When the pattern generator has a Y/C separation output terminal


1 Vp-p (white 100%)
Pattern generator
Y output
(75Ω)
Chroma
output
(75Ω)
Y
75Ω × 4
75Ω × 4
C
286 mVp-p (Burst)
Note 3
VS-124 board
D3.6V
CN203 (Note 1)
⑦
⑬
⑮
⑰
㉒
CAM Y
CAM
GND
CAM C
REG H
Note 2
75Ω resistor
(Parts cord: 1-247-804-11)
VTR with S video terminal
(E-E mode)
Pattern generator
S video output
Video input
Video output
(75Ω)

- When the pattern generator has no Y/C separation output terminal

Note 1: Remove the VC-160 board.
Note 2: Connect Pins ⑦ and ㉒ of CN203 with the jumper wire.
Note 3: The chroma signal input is not required for some adjustments.

Fig. 6-3-1.

3-1-4. How to Set the REC Mode

1) REC key forbidden accept mode cancel
   1. Connect the adjusting remote commander to the remote terminal.
   2. Turn on the power.
   3. Turn on the HOLD switch of the adjusting remote commander.
   4. Select the page: 1 address: 00, and set the data to 01.
   5. After memorizing the data of address: 17 of page: D, set data: 12 to the address.
   6. Press PAUSE button on the adjusting remote commander.

The REC key is accepted through the above procedure.

2) REC mode setting
   1. Turn off the HOLD switch of the adjusting remote commander.
   2. Press REC buttons of the adjusting remote commander.
   3. Perform "3. Procedure after completed the adjustment", after completing adjustment.

3) Procedure after completed the adjustment
   Be sure to return the mode to REC key forbidden accept mode after adjustment.
   1. Connect the adjusting remoter controller.
   2. Turn on the power.
   3. Turn on HOLD switch of the adjusting remote commander.
   4. Select the page: 1 address: 00, and set the data to 01.
   5. Set the data memorized at step 1)-5 to address: 17 of page: D.
   6. Press PAUSE button on the adjusting remote commander.
   7. Turn off the power.

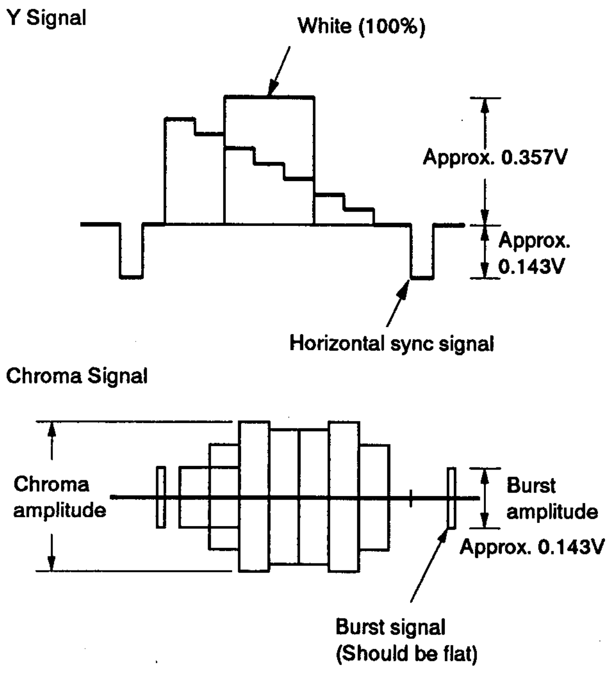
3-1-5. Checking the Input Signals

Because the video signal obtained from the pattern generator is used as the adjustment signal for adjusting the VTR section, the video output signal must satisfy the given specifications.

1. CAMERA Input

Connect the oscilloscope to Pin ⑬ of CN203 on VS-124 board, and check that the sync signal of the Y signal is approximately 0.143 Vp-p and that the amplitude of the video section is approximately 0.357 Vp-p. (When a VTR with the S VIDEO output terminal is used, also check that the chroma signal and burst signal have not remained.) Connect the oscilloscope to Pin ⑰ of CN203 on VS-124 board, and check that the burst signal amplitude of the chroma signal is approximately 0.143 Vp-p and flat, and that the amplitude ratio of the burst signal to the chroma signal is 0.30 : 0.66. The Y and chroma signals used in the adjustment are shown in Fig. 6-3-2.

Note: Be sure to check in the recording mode.


Y Signal
White (100%)
Approx. 0.357V
Approx. 0.143V
Horizontal sync signal
Chroma Signal
Chroma amplitude
Burst amplitude
Approx. 0.143V
Burst signal (Should be flat)

Burst amplitude: Chroma amplitude=0.30:0.66

Fig. 6-3-2. Color bar signal of pattern generator

2. VIDEO Input

Connect the oscilloscope to the video terminal, and check that the sync signal amplitude of the video signal is approximately 0.286V, the amplitude of the video section is approximately 0.714V, the amplitude of the burst signal is approximately 0.286V and flat, and that the level ratio of the burst signal to the "red" signal is 0.30 : 0.66.

The video signal (color bar) used for adjusting the VTR section is shown in Fig. 6-3-3.

Note: Be sure to check in the record mode.

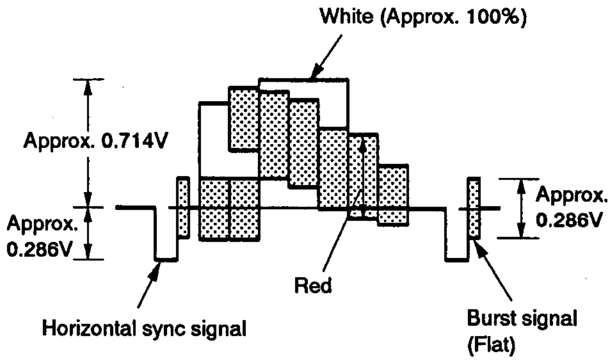

White (Approx. 100%)
Approx. 0.714V
Approx. 0.286V
Approx. 0.286V
Red
Horizontal sync signal
Burst signal (Flat)

Fig. 6-3-3. Color Bar Signal of Pattern Generator

3-1-6. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment. If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record -ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1NP	Standard 8 mm	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6N	Standard 8 mm	MP	SP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5NSP	Standard 8 mm	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. } Color bar section 400 Hz 20 sec. 14 kHz 20 sec. Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4NL	Standard 8 mm	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		

Tape type

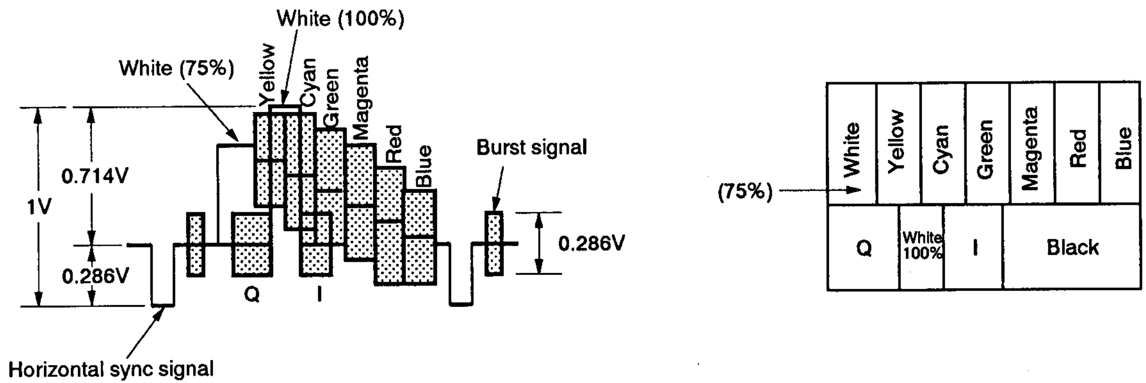
MP············· Particle type metal tape

ME············· Evaporated type metal tape

Table 6-3-1.

Fig. 6-3-4. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure using the video output terminal (Terminated at 75 Ω)


White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst signal
0.714V
1V
0.286V
0.286V
Q
I
Horizontal sync signal
(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Q
White 100%
I
Black

Color bar signal waveform

Color Bar Pattern

Fig. 6-3-4. Color Bar Signals of the Alignment Tape

3-1-7. Output Level and Impedance

Video output	Phono-jack, 1 Vp-p, 75Ω , unbalanced, sync negative
Audio output	Phono-jack, –7.5 dBs, (at load impedance 47 kΩ) impedance less than 2.2 kΩ

3-1-8. Service Mode

Note: After the completion of the all adjustments, cancell the service mode by either of the following ways.

1) Unplug the main power supply and remove the lithium battery. (In this case, date and time and menu setting have been set by users are canceled. Perform resetting.)
2) Return data of the address: 00 on page: 1 to 00. And when data on page: 2 is changed, return the data to the original condition.

1. Test mode setting

Set/release each test mode. Set data: 01 to page: 1, address: 00, before setting the data.

Page D	Address 02

Data	Function
00	Normal
01	Test mode 1 Various emergency prohibitions and releases Drum, capstan, loading motor, reel, tape top and end, DEW SP/LP automatic discrimination prohibition, manual switching, 5 minutes pause release prohibition Power off prohibition/release by battery end

Page D	Address 03

Data	Function
00	Normal
01	Camera power ON
02	VTR power ON
03	Camera + VTR power ON

* For page D, the data set will be recorded in the nonvolatile memory by pressing the PAUSE button on the adjusting remote commander. Take note that, in this case, the test mode will not be released even if the main power has been turned off (6.3 Vdc).

* Be sure to return this address data to 00 after completing adjustments/repairs and press the PAUSE button of the adjusting remote commander.

2. Emergency code

Fault (error) symptoms can be checked.

Page D	Address E4

Last emergency code
……Last error code generated (This data will be renewed each time an error occurs.)

Page D	Address E8

2nd emergency code
……2nd error code generated

Page D	Address EC

First emergency code
……First error code generated

* Be sure to rewrite the data of addresses E4, E8 and EC to 00 after repairs/adjustments.

* When rewriting the data, be sure to press the PAUSE button of the remote commander after setting the data.

Code	Error Condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Reel errors at other times
04	Capstan error
05	FG error during drum start up
06	PG error during drum start up
07	FG error during normal drum conditions
08	PG error during normal drum conditions
09	Phase error during normal drum conditions

3. Emergency mode

The operation mode can be checked during faults.

Page D	Address E5

Last emergency mode
……The operation mode when the last error is generated
(This data will be renewed each time an error occurs.)

Page D	Address E9

2nd emergency mode
……The operation mode when the 2nd error is generated

Page D	Address ED

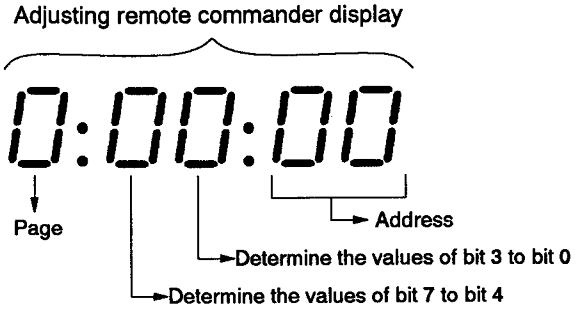
First emergency mode
……The operation mode when the first error is generated

- * Be sure to rewrite the data of addresses E5, E9 and ED to 00 after repairs/adjustments.
- * When rewriting the data, be sure to press the PAUSE button of the adjusting remote commander after setting the data.

Code	Error Conditions
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
46	CUE
56	REVIEW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
83	REWIND
85	REC REVIEW (+)
95	REC REVIEW (–)
97	–PB PAUSE
A2	EMERGENCY LOADING
A5	EDIT SEARCH (+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH (–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

4. Bit value discrimination

Bit values must be discriminated using the display data of the adjusting remote commander for the following items. Use the table below to discriminate if the bit value is "1" or "0".


Adjusting remote commander display
0:00:00
Page
Address
Determine the values of bit 3 to bit 0
Determine the values of bit 7 to bit 4

	Remote controller display	Bit value			
		bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ→	8	1	0	0	0
	9	1	0	0	1
	A(A)	1	0	1	0
	B(b)	1	0	1	1
	C(c)	1	1	0	0
	D(d)	1	1	0	1
Ⓑ→	E(E)	1	1	1	0
	F(F)	1	1	1	1

(Example) If the remote commander display data is "8E", bit values from bit7 to bit4 can be discriminated from column Ⓐ, and those from bit3 to bit0 from column Ⓑ.

5. Battery voltage check

Page 2	Address 47

Display Data	Battery Voltage
F0	Approx. 10.6 Vdc
E0	Approx. 9.9 Vdc
D0	Approx. 9.2 Vdc
C0	Approx. 8.5 Vdc
B0	Approx. 7.8 Vdc
A0	Approx. 7.1 Vdc
90	Approx. 6.4 Vdc
80	Approx. 5.7 Vdc
70	Approx. 5.0 Vdc

Using method:

Order	Page	Address	Data	Procedure
1	2	00	01	Preparation
2	2	47		The battery voltage can be discriminated by the display data.

* Voltage measurement accuracy is approx. ± 10%.

6. Mechanism controller input/output check

Page 2	Address 83

Bit	IN/OUT Signal	Condition
0		
1	E/L DET	"1"=Hi8, "0"=Normal
2	SP/LP DET	"1"=SP, "0"=LP
3	CLOG DET	"1"=Clog detected, "0"=Others
4	REC PROOF	"1"=Recording prohibited, "0"=Recording possible
5	TAPE PREEND	"1"=Tape preend, "0"=Others
6	DEW DET	"0"=Condensation occured, "1"=Others
7	CASSETTE IN	"0"=No cassette

Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Preparation
2	2	83		The condition of each input signal can be discriminated by differentiating the bit value of the display data.

Page 2	Address 84

Bit	IN/OUT Signal	Condition
0	VA PB MODE	"1"=PB, "0"=REC
1	RP PB MODE	"1"=PB, "0"=REC
2	JOG	"1"=Variable speed playback, "0"=Others
3	ME/MP SW	"1"=ME tape, "0"=Other tape
4	Hi8 MP SW	"1"=Hi8 MP tape, "0"=Other tape
5	SERVO OPERATION	"1"=SP mode, "0"=LP mode
6	VIDEO MUTE	"1"=Mute, "0"=Video output
7	AUDIO MUTE	"1"=Mute, "0"=Audio output

Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Preparation
2	2	84		The condition of each signal can be discriminated by differentiating the bit value of the display data.

7. Mode switch and CC DOWN switch check

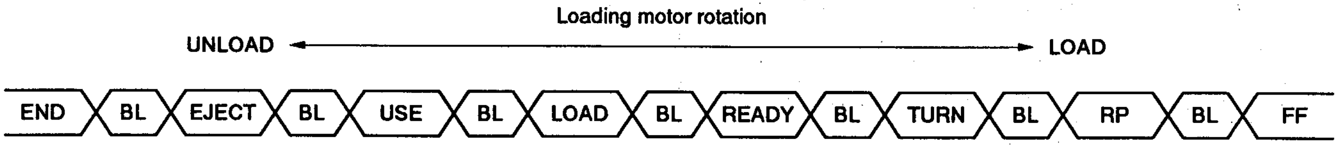
The mode switch position (mechanical section condition) can be checked.

Page 3	**Address E9**

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 2	MSW 1	MSW 0	CC DOWN				

				DATA	**POSITION**	**FUNCTION**
0	0	0	0/1	E*/F*	BL	Interval of each position
0	1	1	1	7*	END	FULL END processing (T side lock removal)
0	0	1	1	3*	EJECT	Cassette compartment ejection
1	0	1	1	B*	USE	EJECTED (Unskate end)
0	0	1	0	2*	LOAD	LOADING (Skate in)
1	0	0	0	8*	READY	NORMAL STOP position
1	1	0	0	C*	TURN	OFF of pinch roller only with STOP↔FF/REW (oscillating position)
0	1	0	0	4*	RP	PB, REC, RVS, REV, CUE
0	0	0	0	0*	FF	FF/REW

*: Don't care


Loading motor rotation
UNLOAD
LOAD
END
BL
EJECT
BL
USE
BL
LOAD
BL
READY
BL
TURN
BL
RP
BL
FF

Using method:

Order	**Page**	**Address**	**Data**	**Procedure**
1	3	00	00	Preparation
2	3	E9		The mode switch position and CC DOWN switch condition can be discriminated by the display data.

8. Tape top/end sensor check

Page 3	Address 0A

Display Data	Tape Top/End Sensor Condition
00	Tape present (Middle of tape)
01	Tape end
10	Tape top
11	No tape

Tape end sensor condition
Tape top sensor condition

"0"=Non active (Not receiving light)
"1"=Active (Receiving light)

Using method:

Order	Page	Address	Data	Procedure
1	3	00	02	Preparation
2	3	0E	10	Preparation
3	3	0A		The condition of the tape top/end sensor can be discriminated by the display data.

9. Version of mechanical control microprocessor

Page 3	Address 0B

Display Data	Microprocessor version
01	Version 1

Using method:

Order	Page	Address	Data	Procedure
1	3	00	02	Preparation
2	3	0B		The microprocessor version can be discriminated by the display data.

10. Page D address list

Note 1: The adjustment data initial value is the data input before performing video section adjustments (Page D) if the Page D data has been erased due to some reason.

Note 2: The data written in the adjustment data memo column are fixed.
After adjusting, check that these data have not been rewritten by mistake.

Note 3: In some case, data have been input to the page D address 91 to D3 and F0 to FF. This has no relation to the adjustment.

Address	Adjustment data	
	Initial value	Memo column
00		
01		
02	00	00
03	00	00
04	80	
05	0B	
06	66	
07	7F	
08	84	
09	8A	
0A	8E	
0B	00	00
0C		
0D		
0E		
0F		
10	00	00
11	00	00
12	00	00
13	00	00
14	95	95
15	77	77
16	01	01
17	02	02
18	05	05
19	40	40
1A	48	48
1B	20	20
1C	00	00
1D	00	00
1E		
1F		

Table 6-3-2. (1)

Address	Adjustment data	
	Initial value	Memo column
20		
21		
22		
23	00	00
24	00	00
25	00	00
26	14	14
27	14	14
28	64	64
29	64	64
2A	6E	6E
2B	6E	6E
2C	64	64
2D	64	64
2E	6E	6E
2F	6E	6E
30	DC	DC
31	DC	DC
32	DC	
33	DC	
34	DC	DC
35	DC	DC
36	DC	
37	DC	
38	E4	
39	EB	
3A	E4	
3B	EB	
3C		
3D		
3E		
3F		
40	A9	
41	A9	
42	A9	
43	A9	
44	A9	
45	A9	
46	A9	
47	A9	
48		
49		

Table 6-3-2. (2)

Address	Adjustment data	
	Initial value	Memo column
4A		
4B		
4C		
4D		
4E		
4F		
50	A2	A2
51	A1	A1
52		
53		
54	00	00
55	00	00
56	90	90
57	00	00
58	00	00
59	75	75
5A	E6	E6
5B	E6	E6
5C	E6	E6
5D	E6	E6
5E	E6	
5F	E2	E2
60	E2	E2
61	E2	E2
62	E2	E2
63	E2	
64		
65		
66		
67		
68		
69	E6	E6
6A	E6	E6
6B	E6	E6
6C	E6	E6
6D	E6	E6
6E		
6F		
70	8E	
71	95	
72	B0	B0
73	B0	B0

Table 6-3-2. (3)

Address	Adjustment data	
	Initial value	Memo column
74	FF	FF
75	BB	
76	FF	FF
77	97	
78	00	00
79	00	00
7A	86	86
7B	86	86
7C	00	00
7D	00	00
7E	00	00
7F	00	00
80	99	
81	99	
82	A5	
83	A9	
84		
85	69	69
86	00	00
87	69	
88	B5	B5
89	B5	B5
8A	00	00
8B	48	48
8C	AF	
8D	AF	
8E	AF	
8F	AF	
90	60	60
91 to AF		
B0*1	A0	
B1*1	AE	
B2*1	95	
B3*1	7A	
B4*1	6A	
B5*1	70	
B6*1	90	
B7*1	35	
B8*1	7A	
B9*1	7A	
BA*1	70	70
BB*1	F0	F0

*1: CCD-TR33/TR460 only

Table 6-3-2. (4)

Address	Adjustment data	
	Initial value	Memo column
BC to DF		
E0		
E1		
E2		
E3		
E4	00	
E5	00	
E6	00	
E7	00	
E8	00	
E9	00	
EA	00	
EB	00	
EC	00	
ED	00	
EE	00	
EF	00	

Table 6-3-2. (5)

3-2. POWER SYSTEM ADJUSTMENTS

1. Power Voltage Check (DD-77 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
D5V check	
Measurement Point	Pin ㉙ of CN901
Specified Value	4.9 ± 0.1 Vdc
EVF5V check	
Measurement Point	Pin ㊴ of CN901
Specified Value	4.9 ± 0.1 Vdc
VID 5V check	
Measurement Point	Pins ㉓ and ㉔ of CN901
Specified Value	4.9 ± 0.1 Vdc
AU 5V check	
Measurement Point	Pin ㉟ of CN901
Specified Value	4.9 ± 0.1 Vdc
RP 5V check	
Measurement Point	Pin ⑳ of CN901
Specified Value	4.9 ± 0.1 Vdc
CAM5V check	
Measurement Point	Pins ㉕ and ㉖ of CN901
Specified Value	4.85 ± 0.1 Vdc
SS 3.6V check	
Measurement Point	Pin ㉝ of CN901
Specified Value	3.6 ± 0.1 Vdc
D3.6V check	
Measurement Point	Pins ㉑ and ㉒ of CN901
Specified Value	3.6 ± 0.1 Vdc
CAM 15V check	
Measurement Point	Pin ㉗ of CN901
Specified Value	15 ± 0.3 Vdc
CAM –8.5V check	
Measurement Point	Pin ㉛ of CN901
Specified Value	$-8.5^{+0.25}_{-0.4}$ Vdc
MT 5V check	
Measurement Point	Pins ⑨, ⑱ and ⑲ of CN901
Specified Value	5.0 ± 0.1 Vdc

3-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "3-1-8. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 90, (B0 to BB)

( ): CCD-TR33/TR460 only

Input method:

1) Set data: 01 to page: 1, address: 01.
2) Select page D, and input the initial value to each address. (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote commander before changing the address.)

2. Battery End Adjustment

Set the battery end voltage.
If the voltage is incorrect, the life of the battery will shorten.
The image at the battery end will also be rough.

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	06, 07, 08, 09, 0A

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 6-3-5.

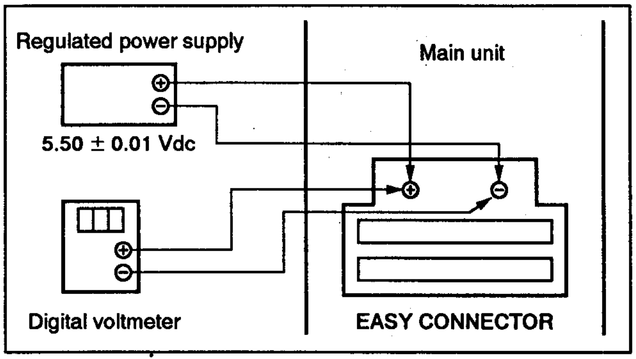


Fig. 6-3-5.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Set data: 01 to page: 1, address: 00.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.50 ± 0.01 Vdc.
4) Set data: 01 to page: 2, address: 00.
5) Select page: 2, address: 49, read the adjusting remote commander display data, and this data is named D6.
6) Set data D6 to page: D, address: 06, and press the PAUSE button of the adjusting remote commander.
7) Convert D6 to decimal notation, and obtain D6′. (Refer to Table 6-1-3. "Hexadecimal notation–decimal notation conversion table")
8) Calculate D7′, D8′, D9′ and DA′ using following equations (decimal notation calculation).
   D7′=D6′+3
   D8′=D6′+8
   D9′=D6′+14
   DA′=D6′+18
9) Convert D7′, D8′, D9′ and DA′ to hexadecimal notation, and obtain D7, D8, D9 and DA.
10) Set data: D7′ to page: D, address: 07, and press the PAUSE button of the adjusting remote commander.
11) Set data: D8′ to page: D, address: 08, and press the PAUSE button.
12) Set data: D9′ to page: D, address: 09, and press the PAUSE button.
13) Set data: DA to page: D, address: 0A, and press the PAUSE button.
14) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 6-3-5.

Checking method:

Remove the adjusting remote commander, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Check that the 🪫 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
4) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.53 ± 0.01 Vdc.
5) Check that the 🪫 mark on the EVF display and the TALLY lamp blinks every second.
6) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.47 ± 0.01 Vdc.
7) Check that the 🪫 mark on the EVF display and the TALLY lamp are blinking faster.

3-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (VS-124 board)

If deviated in this case causes switching noise or jitter on the played back screen.

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ④ of CN102 (RF SWP) CH2: Pin ③ of CN102 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04, 05
Specified Value	t1=0 ± 10 μsec

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote commander.

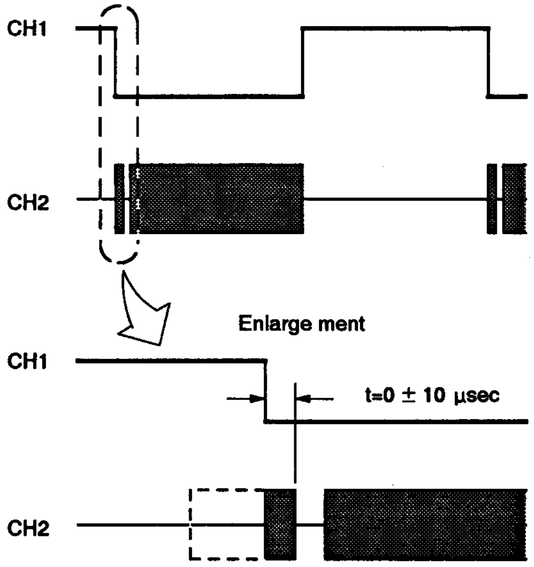


Fig. 6-3-6.

3-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.

The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Figs. 6-3-2. and 6-3-3.

[Adjusting procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) SYNC AGC level adjustment
5) Comb filter adjustment
6) Emphasis input level adjustment
7) DE EMPH level adjustment
8) PB Y out level adjustment
9) Y FM carrier frequency adjustment
10) Y FM deviation adjustment
11) Chroma emphasis adjustment 1
12) Chroma emphasis adjustment 2
13) Comb filter fine adjustment
14) REC Y level adjustment
15) REC L adjustment
16) REC CHROMA level adjustment
17) REC ATF level check

1. Playback Frequency Characteristic Adjustment (VS-124 board)

Eliminate the differences in the head characteristics of each channel. If there are differences, flickers and over modulation noises will be produced.

Note 1: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	CH1: Pin ③ of CN102 (PB RF) EXT TRIG: Pin ④ of CN102 (RF SWP)
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [-]
Adjustment Page	D
Adjustment Address	5E, [63]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of address: 5E [63] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.

Note 2: After each address adjustment, be sure to press the PAUSE button of the adjusting remote commander and memorize the data.

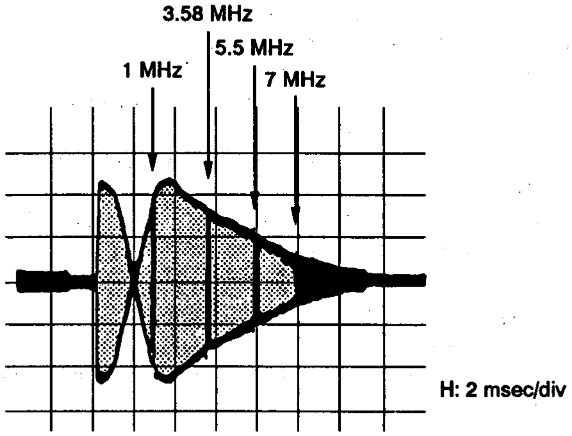


Fig. 6-3-7.

2. Flying Erase Check (VS-124 board)

Mode	Camera record
Signal	Arbitrary
Measurement Point	Pin ⑫ of CN101 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: 8.0 ± 0.5 MHz Voltage: 6.0 ± 1 Vp-p (ME tape) Above 7.0 Vp-p (MP tape)

Checking method:

1) Check that the oscillation frequency and the oscillation voltage satisfieds the specified value.

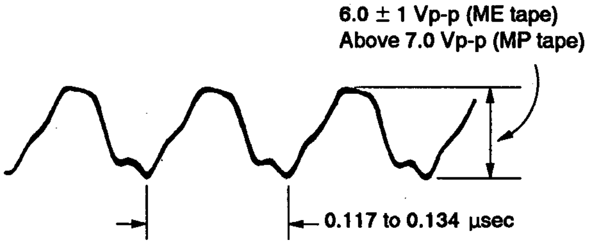


Fig. 6-3-8.

3. VXO Oscillation Frequency Check (VS-124 board)

Mode	Playback
Signal	Color bar
Measurement Point	Pin (61) of IC201 (CL227)
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 50 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin (61) of IC201 is 3579545 ± 50 Hz.

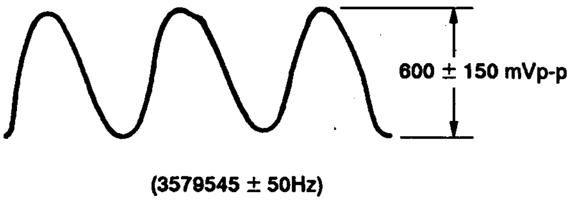


Fig. 6-3-9.

4. SYNC AGC Level Adjustment (VS-124 board)

Adjust so that the Y signal level to be recorded becomes consistent. If it is not consistent, the camera EE image and OA image will be brighter or darker than normal.

Mode	Camera record
Signal	Color bar (Camera input) Note 1
Measurement Point	Pin ⑥ of CN201 (VIDEO I/O) Note 2 (CL298)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	70
Specified Value	A=1.00 ± 0.025V

Note 1: The chroma signal input is not required.
Note 2: Terminate the video out terminal at 75Ω.
75Ω resistor (Part code: 1-247-804-11)

Adjusting method:
1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 70, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

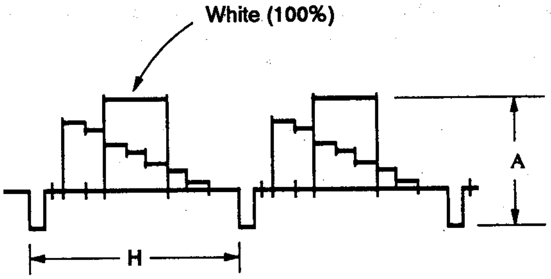
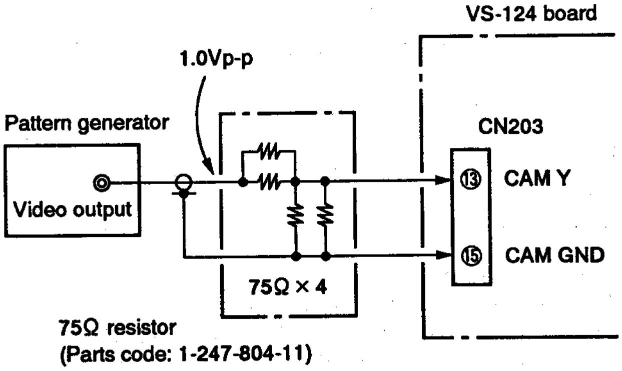


Fig. 6-3-10.

5. Comb Filter Adjustment (VS-124 board)

Mode	Record
Signal	Color bar (Note 1)
Measurement Point	Pin ⑭ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV202 (PHASE)
Adjustment Page	D
Adjustment Address	71
Specified Value	Residual chroma component (A) is minimum.

Note 1: Connect the pattern generator as shown in the following figure.



Adjusting method:
1) Set to the VIDEO input mode.
2) Set to the record mode.
3) Set data: 01 to page: 1, address: 00.
4) Set data: 00 to page: 2, address: 00.
5) Set data: 04 to page: 2, address: B0.
6) After memorizing the data of address: 9A of page: 2, set data: 10 to the address.
7) After memorizing the data of address: 9D of page: 2, set data: 30 to the address.
8) Change the data of page: D, address: 71, and adjust the residual chroma component (A) to minimum.
9) Adjust RV202 so that the residual chroma component becames minimum.
10) Repeat 8) and 9).
11) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments
1) Set the data memorized at step 7) to address: 9D of page: 2.
2) Set the data memorized at step 6) to address: 9A of page: 2.
3) Set data: 00 to page: 2, address: B0.

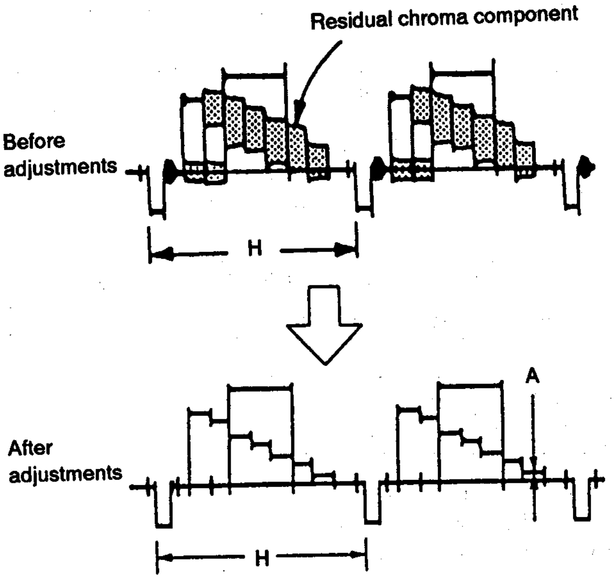

Residual chroma component
Before adjustments
H
After adjustments
A
H

Fig. 6-3-11.

6. Emphasis Input Level Adjustment (VS-124 board)

Y level of emphasis circuit setting. If deviated, this causes too bright or too dark image during play back after recording.

Mode	Camera record
Signal	Color bar (CAMERA input)
Measurement Point	Pin ⑤ of IC201 (EMPH IN) or Pin ⑤ of IC205 (CL204)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	82
Specified Value	A=0.50 ± 0.01V

Note 1: The chroma signal input is not required.

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 82, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

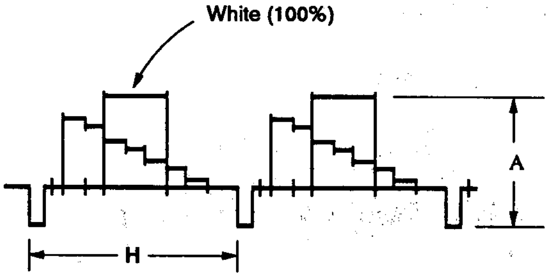

White (100%)
A
H

Fig. 6-3-12.

7. DE EMPH Level Adjustment (VS-124 board)

De-emphasis input level setting. If deviated, this causes excessive brightness or darkness.

Mode	Playback
Signal	Alignment tape: For checking operations Color bar section (WR5-5NSP)
Measurement Point	Pin ㉓ of IC201 (DL IN 1) (CL215)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	87
Specified Value	A=0.54 ± 0.01V

Note 1: The chroma signal input is not required.

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 87, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Perform "PB Y OUT Level Adjustment".

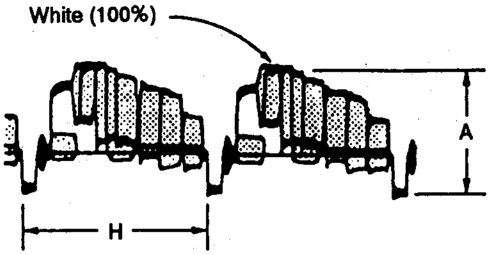


Fig. 6-3-13.

8. PB Y OUT Level Adjustment

PB LINE OUT Y level setting. If deviated, this causes too bright or too dark picture.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Pin ⑥ of CN201 (VIDEO I/O)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	83
Specified Value	A=1.0 ± 0.05V

Note 1: Terminate the video out terminal at 75Ω.
75Ω resistor (Part code: 1-247-804-11)

Note 2: The chroma signal input is not required.

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 83, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

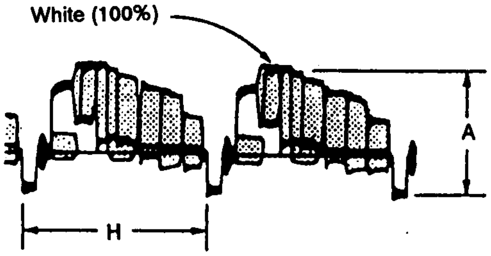


Fig. 6-3-14.

9. Y FM Carrier Frequency Adjustment (VS-124 board)

FM carrier frequency of REC Y setting. If deviated, this caused blurred played back picture or deteriorated resolution.

Mode	Record
Signal	No signal (CAMERA input)
Measurement Point	Pin ㊴ of IC201 (Y RF OUT) (CL304)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	75
Specified Value	4.39 ± 0.01 MHz

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 75, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

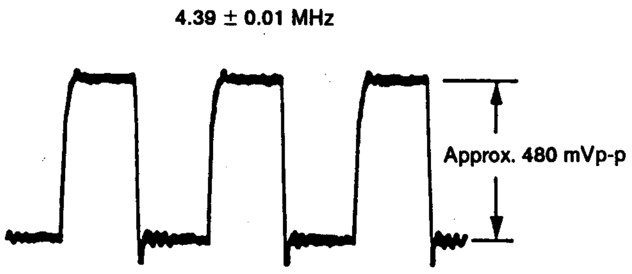


Fig. 6-3-15.

10. Y FM Deviation Adjustment (VS-124 board)

FM deviation of REC Y setting. If deviated, this causes too bright/dark image, or marked occurrence of black picture or deteriorated resolution.

Mode	Record and playback
Signal	Color bar (CAMERA input)
Measurement Point	Pin ㉓ of IC201 (DL IN 1) (CL215)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	77
Specified Value	A=0.54 ± 0.01V

Note 1: Check that "Emphasis Input Level Adjustment", have been completed.

Note 2: The chroma signal input is not required.

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.54 ± 0.01V
5) If the specification is not satisfied, change the data of page: D, address: 77, and repeat steps 2) to 4).

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote commander.
7) Perform "Y FM Carrier Frequency Adjustment".

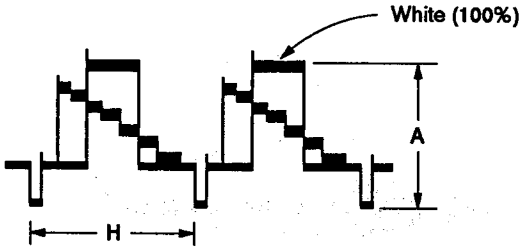


Fig. 6-3-16.

11. Chroma Emphasis Adjustment 1 (VS-124 board)

Emphasis center frequency setting. If deviated, this causes unnatural color.

Mode	Record
Signal	Color bar (CAMERA input)
Measurement Point	Pin ⑧ of IC201 (REC C OUT) (CL216)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	80, 81
Specified Value	Minimum f_0 component

Adjusting method:

1) Set to the record mode.
2) Set data: 01 to page: 00, address: 01.
3) Set data: 00 to page: 2, address: 00.
4) Set data: 04 to page: 2, address: B0.
5) After memorizing the data of address: 9A of page: 2, set data: 02 to the address.
6) Change the data of page: D, address: 80, and adjust so that the amplitude of the latter section of the chroma signal (yellow section) becames minimum.
7) Press the PAUSE button of the adjusting remote commander.
8) Set the same data as address: 80 of page: D to address: 81 of page D.
9) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set the memorized at step 5) to address: 9A of page: 2.
2) Set data: 00 to page: 2, address: B0.

Minimize the amplitude of the latter section of the yellow section.

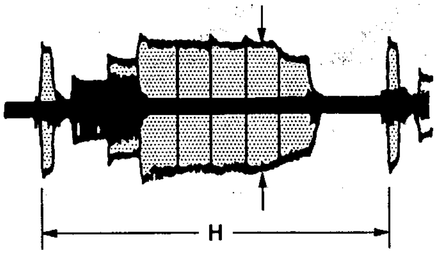


Fig. 6-3-17.

12. Chroma Emphasis Adjustment 2 (VS-124 board)

Emphasis center frequency setting. If deviated, this causes unnatural color.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	D
Adjustment Address	81, 80
Specified Value	The path from the blue luminance point to black luminance point should be a straight line.

Adjusting method:

1) Set data: 01 to page: 00, address: 01.
2) Change the data of page: D, address: 81, and adjust so that the path from the blue luminance point to black luminance point becames a straight line.
3) Press the PAUSE button of the adjusting remote commander.
4) Set the same data as address: 81 of page: D to address: 80 of page: D.
5) Press PAUSE button of the adjusting remote commander.

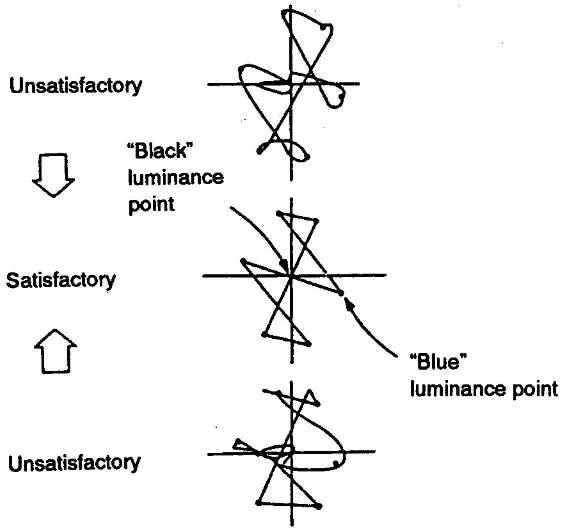


Fig. 6-3-18.

13. Comb Filter Fine Adjustment (VS-124 board)

Set the level and phase of the 1H delayed signal for the comb filter. If deviated, this causes marked occurrence of beets in played back picture.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjusting Element	RV202 (PHASE)
Adjustment Page	D
Adjustment Address	71
Specified Value	Minimum color luminance point movement when the "Edit" switch is turned on/off

Note 1: Turn the edit ON/OFF at the menu screen.

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Minimize the movements of the color luminance point when the edit is on/off with RV202.
3) Change the data of page: D, address: 71 and minimize the movements of the color luminance point when the edit is on/off
4) Press the PAUSE button of the adjusting remote commander.
5) Repeat steps 2) to 4).

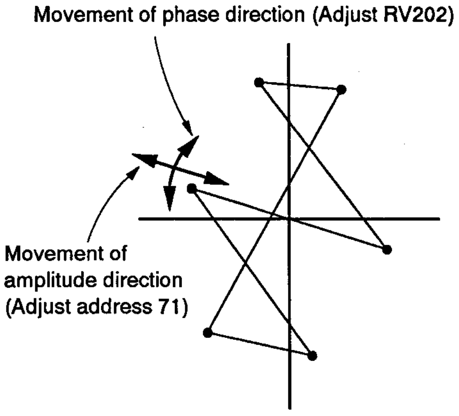

Movement of phase direction (Adjust RV202)
Movement of amplitude direction (Adjust address 71)

Fig. 6-3-19.

14. REC Y Level Adjustment (VS-124 board)

Recording level of luminance signal setting. If deviated, this causes black stretch over modulation noise or color shade.

Mode	Record
Signal	No signal
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope Board width limit: 20 MHz
Adjustment Page	D
Adjustment Address	42, 43, 46, 47
Specified Value	A=145 ± 5 mVp-p

Note: Use a normal MP type tape.

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 47, and adjust so that REC Y level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Set data to address: 42, 43, 46 of page: D as shown in following table.

(Be sure to press the PAUSE button of the adjusting remote commander after setting each data.)

Address	Data
42	Same data as address: 47
43	Same data as address: 47
46	Same data as address: 47

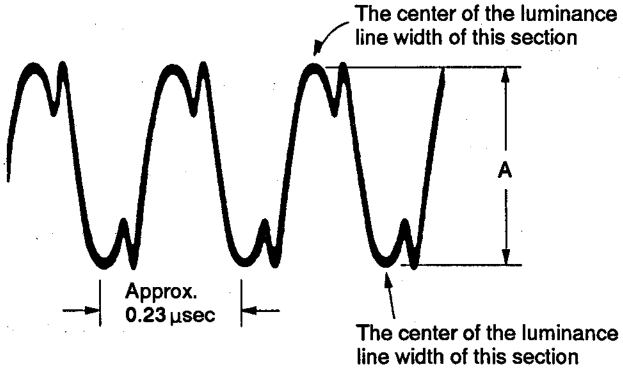

The center of the luminance line width of this section
A
Approx. 0.23 μsec
The center of the luminance line width of this section

Fig. 6-3-20.

15. REC L Adjustment (VS-124 board)

Set the recording levels of the REC AFM signal and REC ATF signal. If the level is too low, the audio S/N will deteriorate, tracking will not be stable, or SP/LP will not be discriminated properly. If too high, color beets will be produced on the self-recording/playback image.

Mode	Record
Signal	No signal (VIDEO input)
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	38, 39, 3A, 3B
Specified Value	A=8.4 ± 1.0 mVp-p

Note 1: Use a MP type tape.
Note 2: AU-183 board is required for this adjustment.

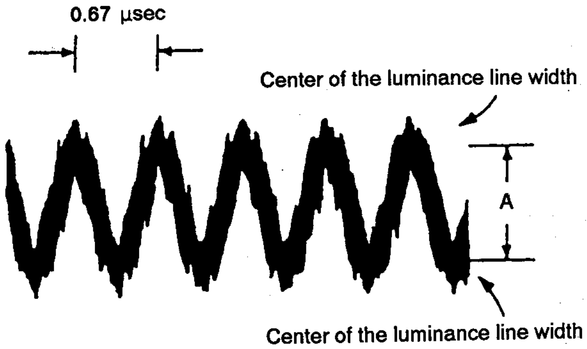

0.67 μsec
Center of the luminance line width
A
Center of the luminance line width

Fig. 6-3-21.

Connection:
1) Connect Emitter of Q113 and GND with a jumper wire.
2) Connect Pin ⑤ of IC508 and GND with a 0.01 μF capacitor.

Adjusting method:
1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 3B, and adjust so that the REC AFM signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Read the data of page: D, address: 3B, and this data is named D3B.
5) Set data: D3B to address: 39 of page D.
6) Press the PAUSE button of the adjusting remote commander.
7) Convert D3B to decimal notation, and obtain D3B′.
(Refer to Table 6-1-3. "Hexadecimal notation-decimal notation conversion table")
8) Culculate D3A′ using following equation (decimal notation calculation).
D3A′=D3B′−7
9) Convert D3A′ to hexadecimal notation, and obtain D3A.
10) Set data: D3A to address: 3A of page D.
11) Press the PAUSE button of the adjusting remote commander.
12) Set data: D3A to address: 38 of page D.
13) Press the PAUSE button of the adjusting remote commander.
14) Perform "REC CHROMA Level Adjustment".

16. REC CHROMA Level Adjustment (VS-124 board)

Set REC CHROMA signal level. If it is lower than its normal level, chroma signal noise in played back picture will increase. If it is set higher, Y signal noises will increase and white modulation noises will be prodused.

Mode	Record
Signal	Color bar (VIDEO input)
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	33, 32, 37, 36
Specified Value	A=26 ± 3 mVp-p

Note 1: Use a MP type tape.

Connection:

1) Connect Emitter of Q113 and GND with a jumper wire.
2) Connect Pin ⑤ of IC508 and GND with a 0.01 μF capacitor. (1-101-004-00)
3) Disconnect AU-183 board.

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 33, and adjust so that the REC CHROMA signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Read the data of page: D, address: 33, and this data is named D33.
5) Set data: D33 to address: 32 of page D.
6) Press the PAUSE button of the adjusting remote commander.
7) Set data: D33 to address: 36 of page D.
8) Press the PAUSE button of the adjusting remote commander.
9) Set data: D33 to address: 37 of page D.
10) Press the PAUSE button of the adjusting remote commander.

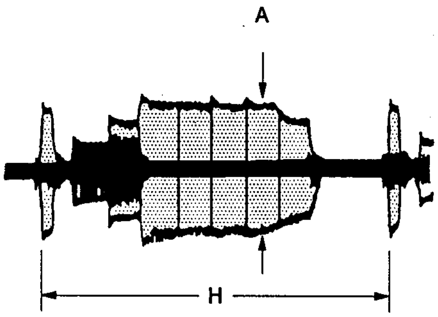


Fig. 6-3-22.

17. REC ATF Level Check (VS-124 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑥ of CN102 (REC 2)
Measuring Instrument	Oscilloscope
Specified Value	A=6.4 ± 1.5 mVp-p

Note 1: Use a MP type tape.

Connection:

1) Connect Emitter of Q113 and GND with a jumper wire.
2) Disconnect AU-183 board.

Adjusting method:

1) Check that the REC ATF signal level (A) satisfise the specified value.

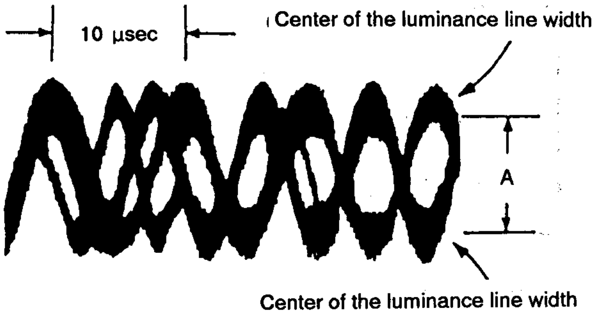
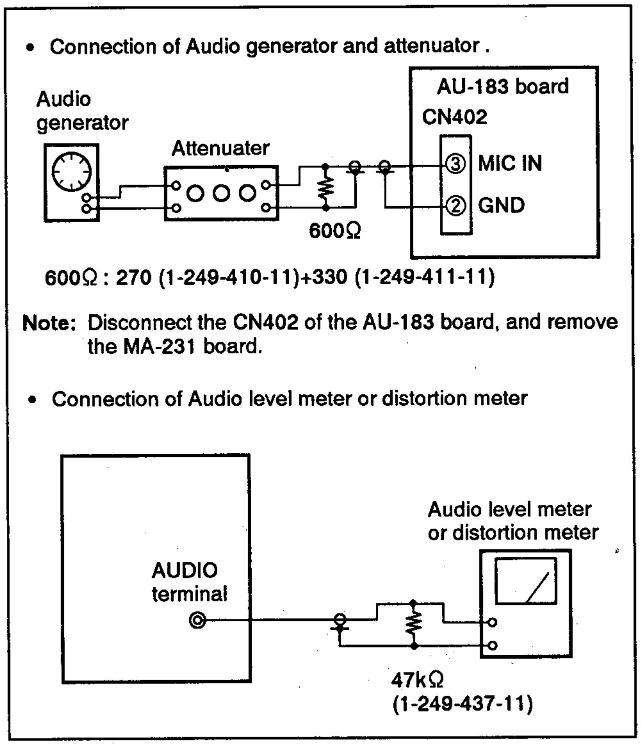

10 μsec
Center of the luminance line width
A
Center of the luminance line width

Fig. 6-3-23.

3-6. AUDIO SYSTEM ADJUSTMENT

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments as shown in Fig. 6-3-24, and perform adjustments.



- Connection of Audio generator and attenuator .

600Ω : 270 (1-249-410-11)+330 (1-249-411-11)

Note: Disconnect the CN402 of the AU-183 board, and remove the MA-231 board.

- Connection of Audio level meter or distortion meter

Fig. 6-3-24.

[Adjustment Procedure]

1) E-E output level check
2) IR adjustment
3) Deviation adjustment
4) Carrier frequency check
5) Carrier level check
6) Overall level characteristics, distortion check
7) Overall noise level check

1. E-E Output Level Check (AU-183 board)

Mode	Camera recording
Signal	400 Hz, –38.5 dBs, Pin ③ of CN402 (MIC IN)
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 2 dBs

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

2. IR Adjustment

Adjust to the optimum audio BPF characteristics of the IC.

If the characteristics is not correct, the distortion rate and S/N ratio will worsen.

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP)
Measurement Point	Audio output terminal
Measuring Instrument	Distortion meter
Adjustment Page	D
Adjustment Address	8E
Specified Value	Minimum distortion

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 8E and adjust so that the distortion is minimum.
3) Press the PAUSE button of the adjusting remote commander.

3. Deviation Adjustment

Adjust to the optimum audio FM signal deviation.

If the adjustment is not correct, its playback level will differ from that of other units.

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	8F
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Set data: 01 to page: 1, address: 00.
2) Change the data of page: D, address: 8F, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote commander.

4. Carrier Frequency Check (AU-183 board)

Mode	Camera recording
Signal	No signal
Measurement Point	Pin ⑨ of CN401 (REC AFM RF) (CL412)
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:
1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

5. Carrier Level Check (AU-183 board)

Mode	Camera recording
Signal	No signal
Measurement Point	Pin ⑨ of CN401 (REC AFM RF) (CL412)
Measuring Instrument	Oscilloscope
Specified Value	A=340 ± 40 mVp-p

Checking method:
1) Check that the 1.5 MHz carrier level satisfies the specified value.

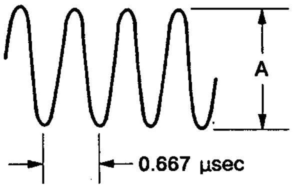


Fig. 6-3-25.

6. Overall Level Characteristic, Distortion Check (AU-183 board)

Mode	Camera recording/playback
Signal	400 Hz, –38.5 dBs, Pin ③ of CN402 (MIC IN)
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2.5 dBs Distortion rate: Below 0.5% (Note 1)

Note: 1) Value when the following filter is used

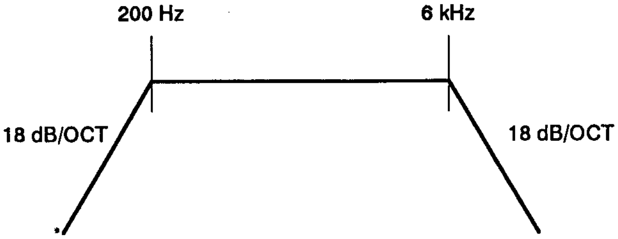


Fig. 6-3-26.

Checking method:
1) Input the 400 Hz, –38.5 dBs signal to Pin ③ of CN402.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal is –7.5 ± 2.5 dBs, and that the distortion rate is below 0.5% (Note 1).

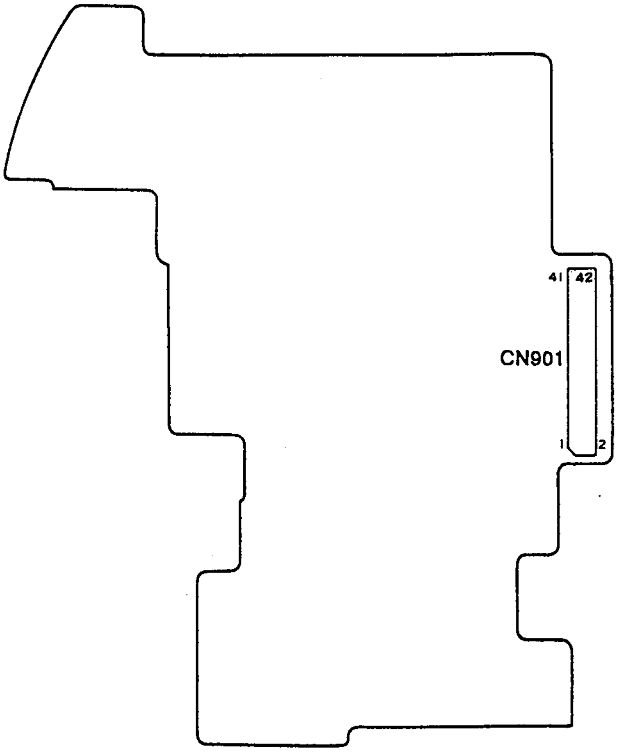
7. Overall Noise Level Check (AU-183 board)

Mode	Camera recording
Signal	No signal: Pin ③ of CN402 (MIC IN)
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –65.0 dBs

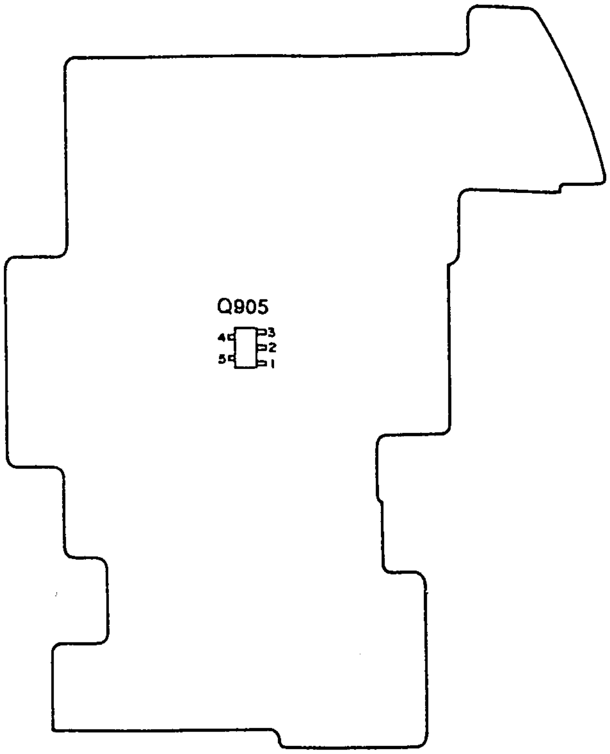
Checking method:
1) Connect Pin ③ of CN402 (MIC IN) and Pin ② of CN402 (GND) with a jumper wire.
2) Record.
3) Remove the jumper wire.
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal is below –65.0 dBs.

3-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

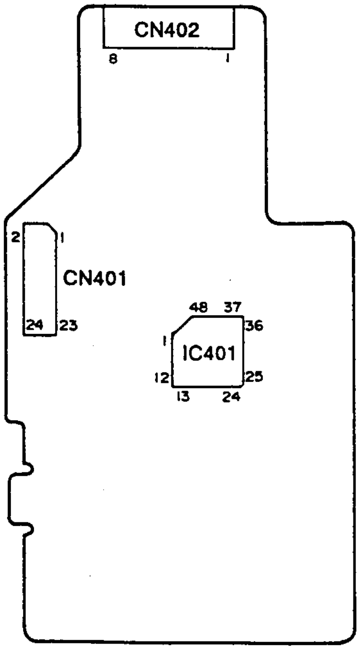
DD-77 BOARD (COMPONENT SIDE)


41
42
CN901
1
2

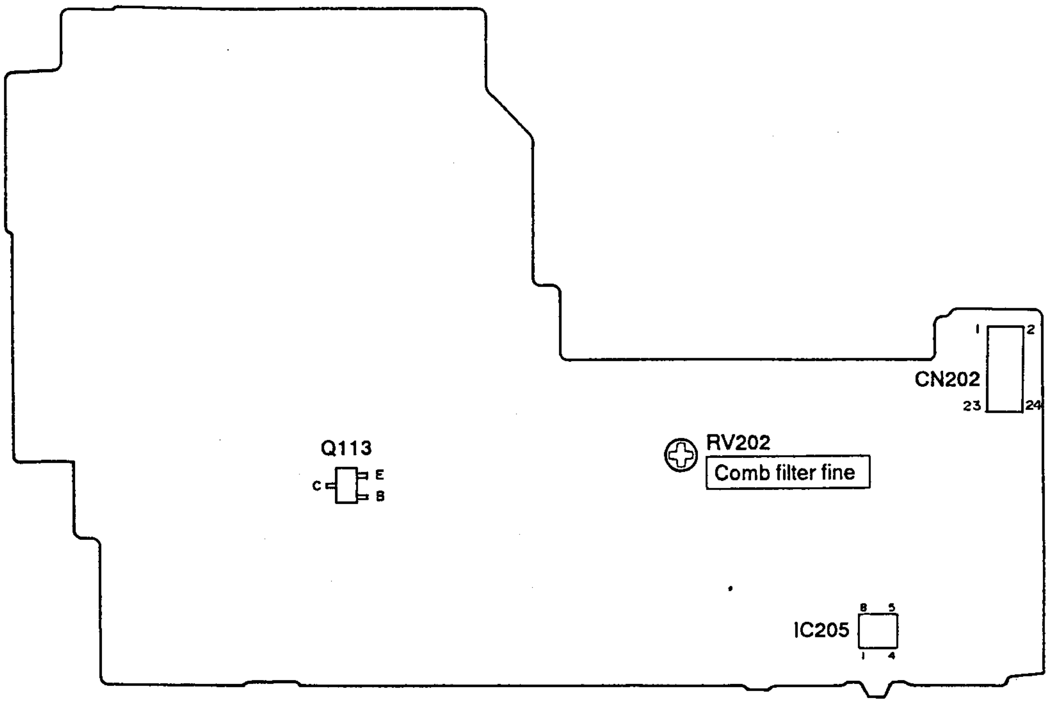
DD-77 BOARD (CONDUCTOR SIDE)



AU-183 BOARD (COMPONENT SIDE)

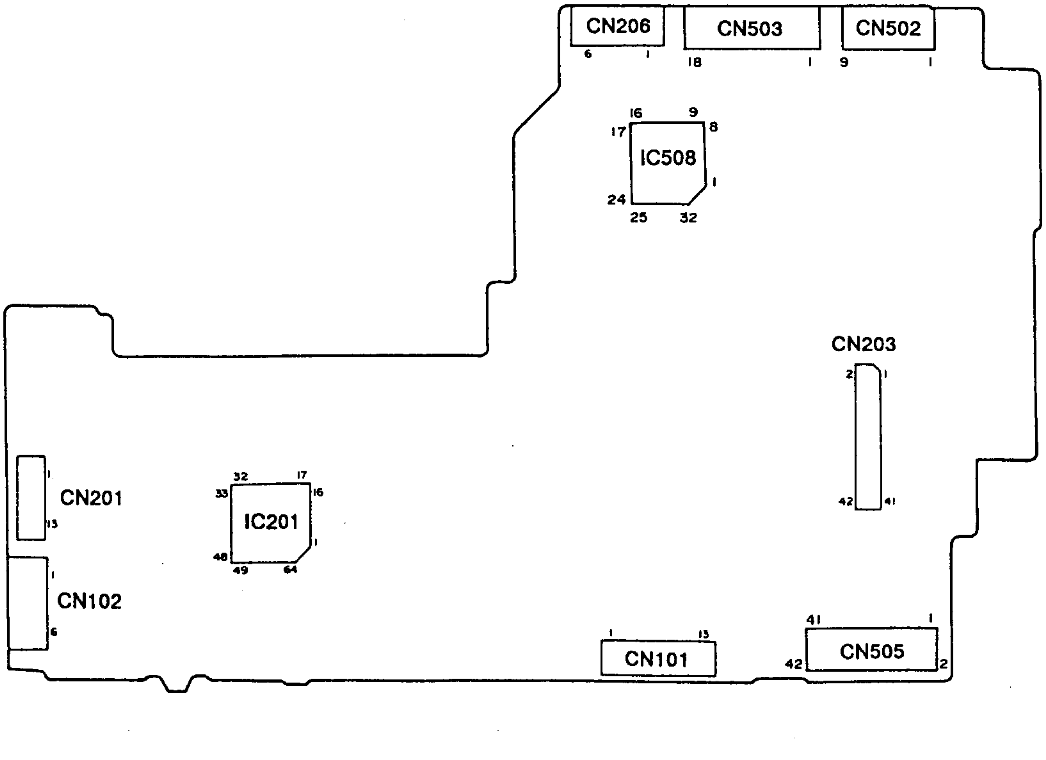

CN402
8
1
2
1
CN401
24
23
48
37
36
1
IC401
12
25
13
24

VS-124 BOARD (COMPONENT SIDE)



1
2
CN202
23
24
Q113
C
E
B
RV202
Comb filter fine
8
5
IC205
1
4

VS-124 BOARD (CONDUCTOR SIDE)



CN206
6
1
CN503
18
1
CN502
9
1
16
9
17
8
IC508
1
24
25
32
CN203
2
1
42
41
1
CN201
13
32
17
33
16
IC201
1
48
49
64
1
CN102
6
1
13
CN101
41
1
42
CN505
2

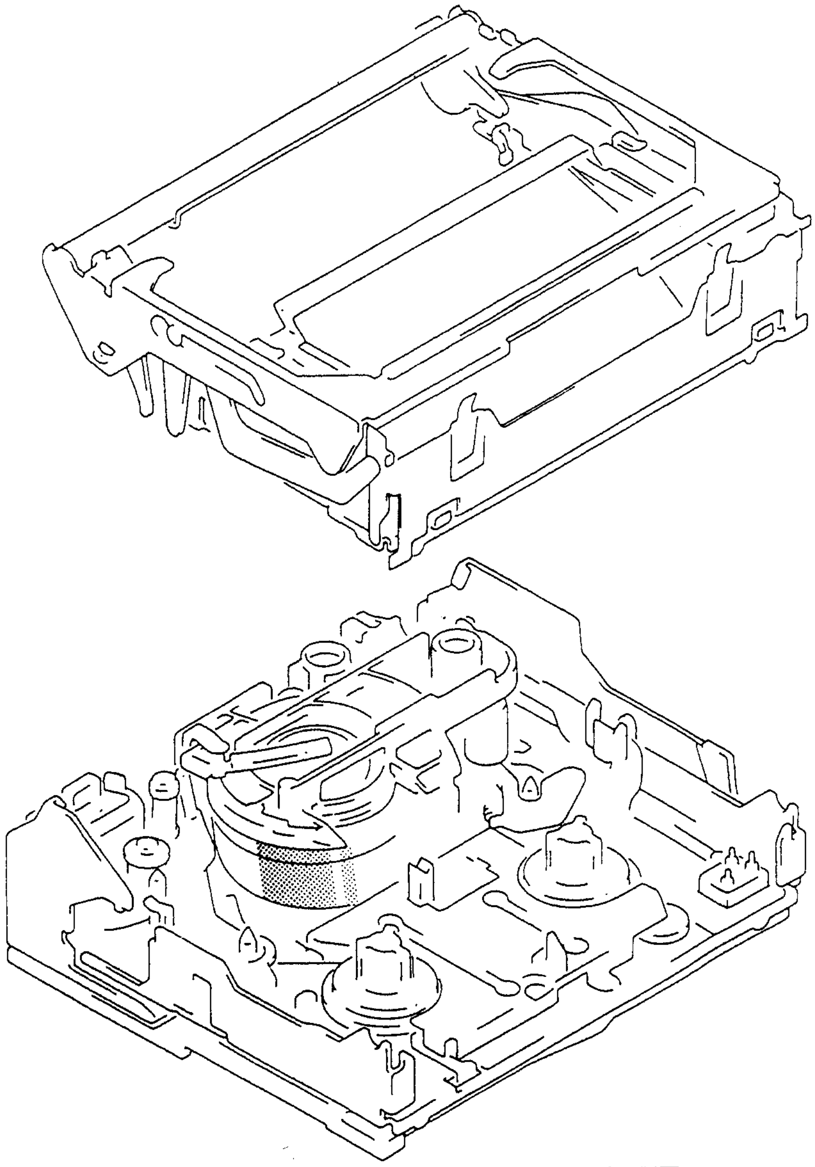
8 mm Video MECHANICAL ADJUSTMENT MANUAL IV

V12995

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the USE mode.
2) Push the part ⓐ of lock arm **1** toward the arrow 🅐 to unlock from lock guide **2**, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws **3** and remove the LS frame **4** toward the arrow 🅑.
4) With the cassette compartment assembly **5** pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively.
   In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly **5** in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

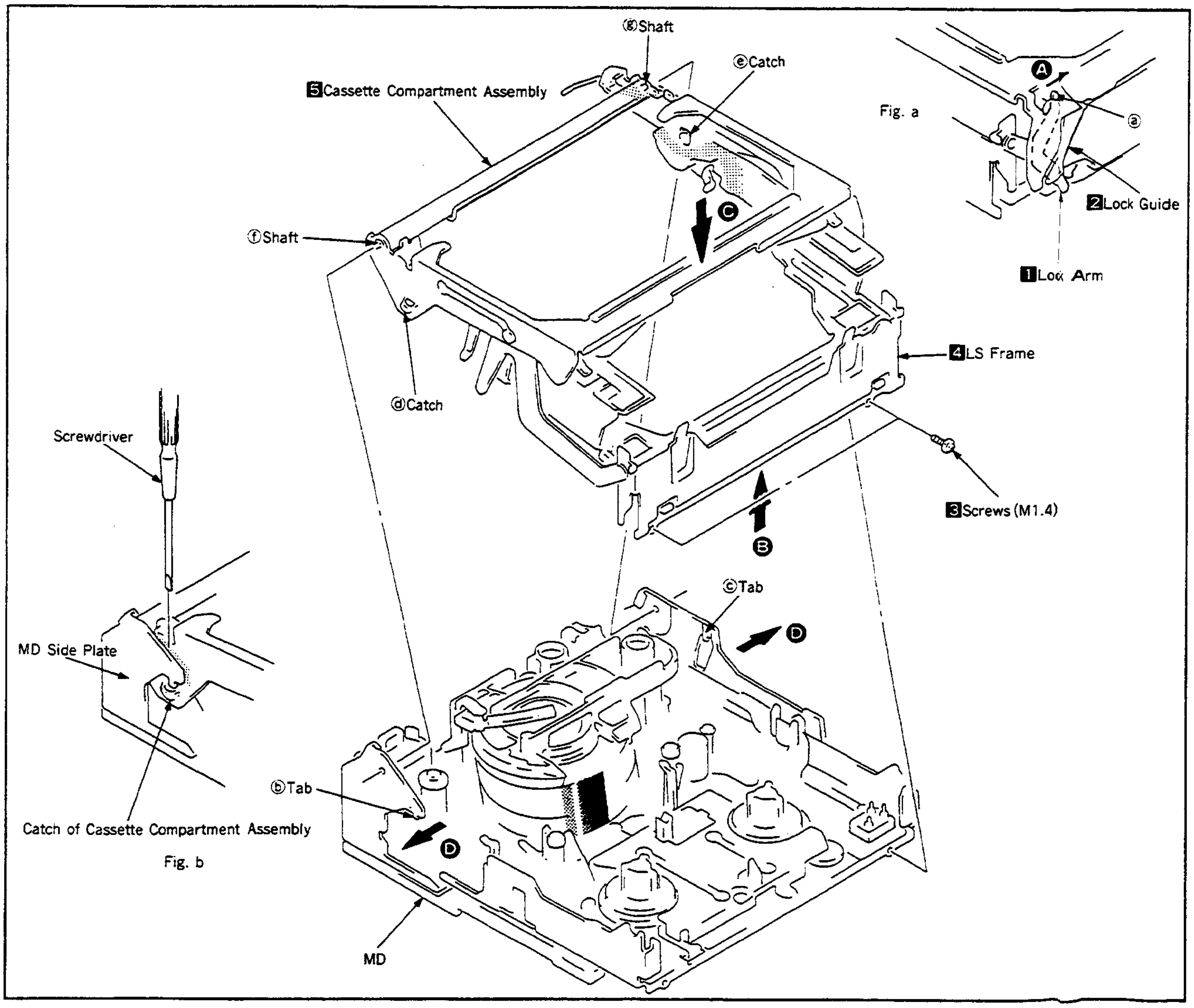

ⓖShaft
ⓔCatch
5 Cassette Compartment Assembly
Fig. a
🅐
ⓐ
2 Lock Guide
1 Lock Arm
ⓕShaft
🅒
4 LS Frame
ⓓCatch
Screwdriver
3 Screws (M1.4)
🅑
ⓒTab
🅓
MD Side Plate
ⓑTab
Catch of Cassette Compartment Assembly
Fig. b
🅓
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder 6 of cassette compartment assembly 5 toward the arrow 🅔, and lower the LS frame 4 toward the arrow 🅕.
3) With the cassette compartment assembly 5 tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.
At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly 5 so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm 1 of cassette compartment assembly must be inserted into a groove in the guide rail 7 on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame 4 inside the LS chassis 8.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws 3.

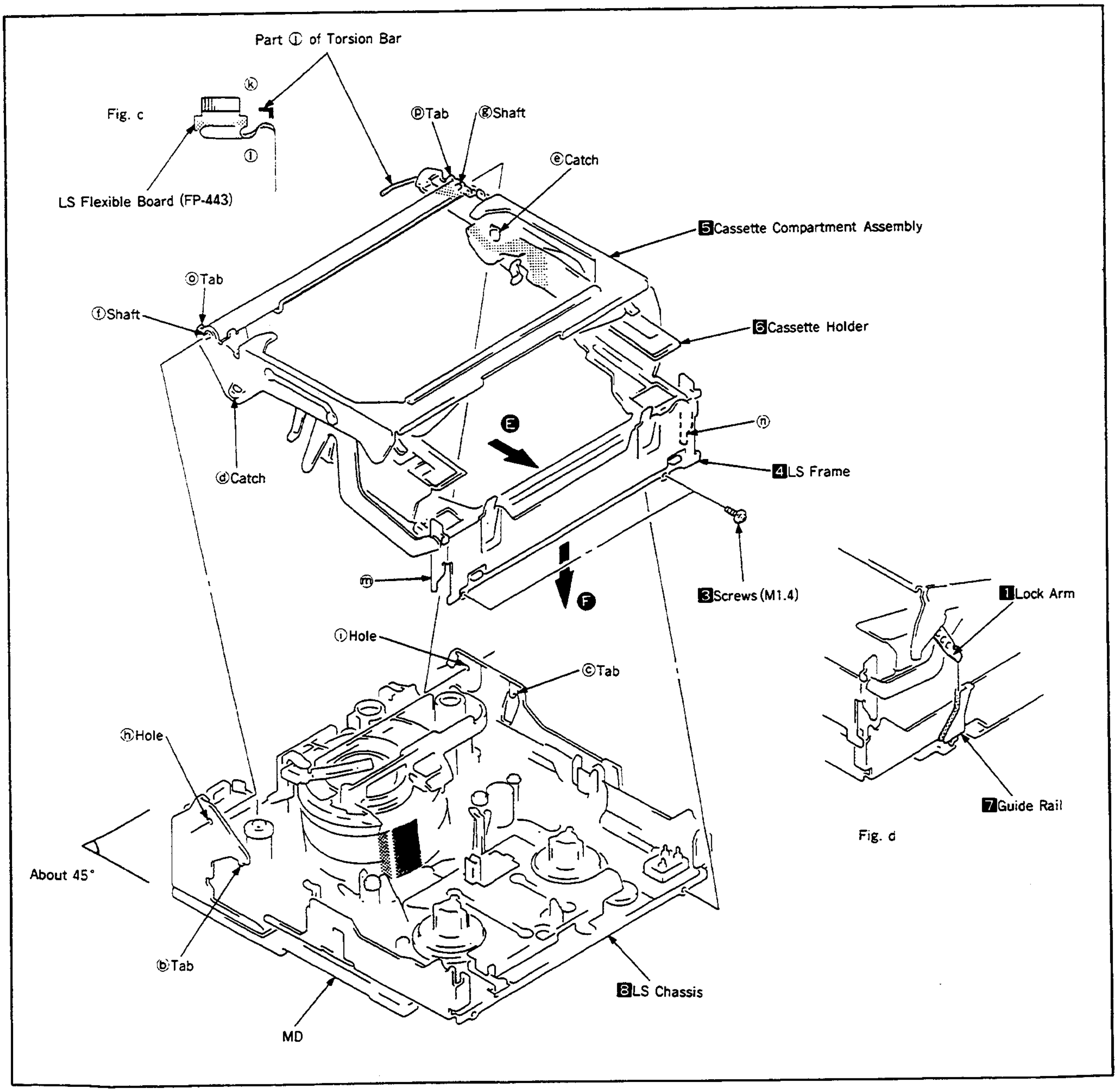

Part ⓙ of Torsion Bar
ⓚ
Fig. c
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
5Cassette Compartment Assembly
ⓞTab
ⓕShaft
6Cassette Holder
🅔
ⓝ
4LS Frame
ⓓCatch
ⓜ
3Screws (M1.4)
1Lock Arm
🅕
ⓘHole
ⓒTab
ⓗHole
7Guide Rail
Fig. d
About 45°
ⓑTab
8LS Chassis
MD

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap ❷ on the Reflector C ❶.
3) Press the pin of the push switch ❸ (ON state) and fix it with adhesive tape ❹ in that state.

Note : Press the asterisked (✱) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch ❺ in an arrow direction as shown in Fig. a.

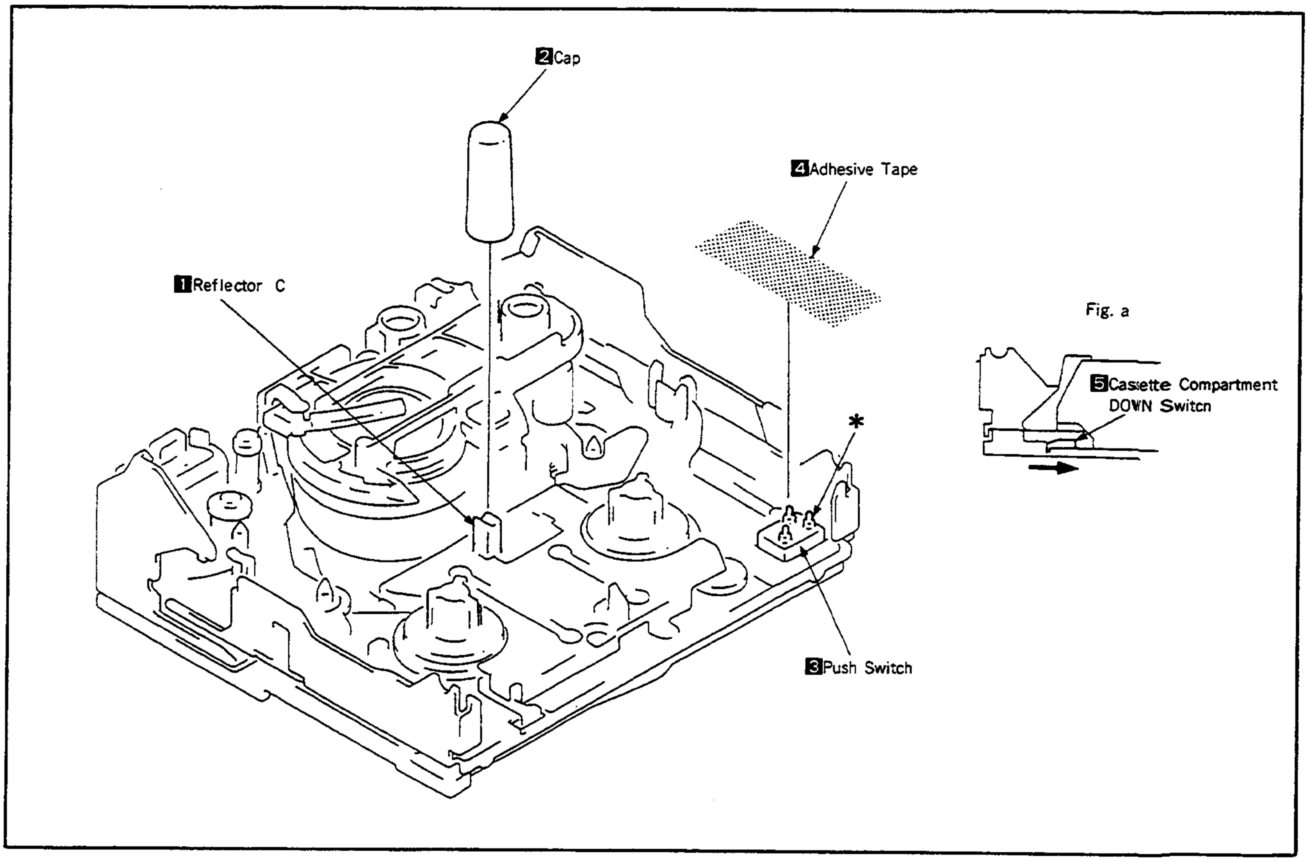

❷Cap
❹Adhesive Tape
❶Reflector C
Fig. a
❺Cassette Compartment DOWN Switch
✱
❸Push Switch

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector.
  U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

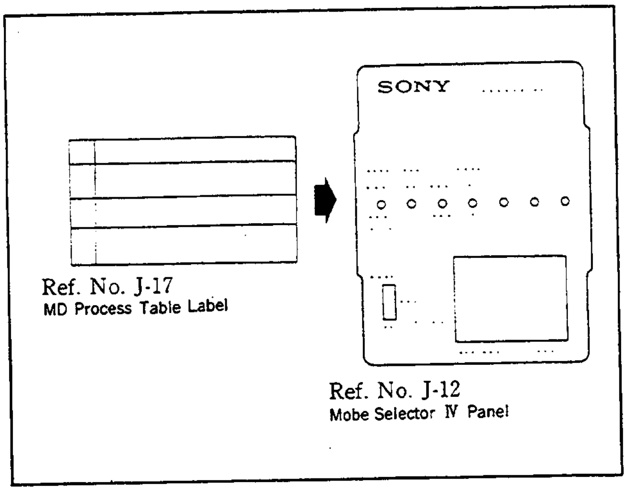

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector Ⅳ Panel

Fig. 4

1 Construction (Fig.5)

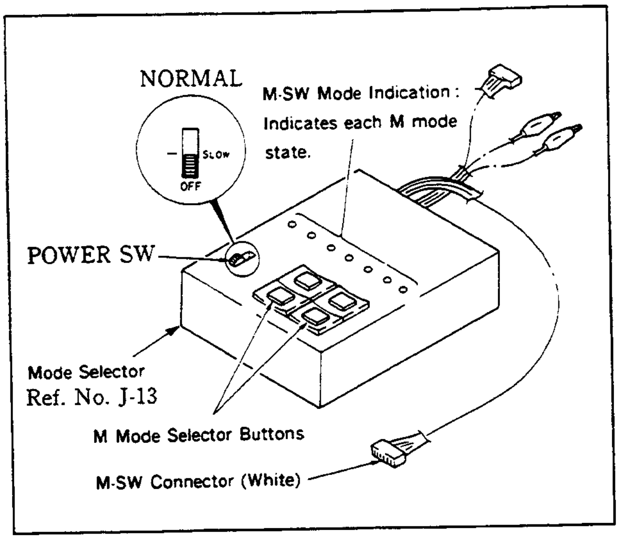

NORMAL
SLOW
OFF
M-SW Mode Indication : Indicates each M mode state.
POWER SW
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector ❶ and M-SW connector ❷ into the mode selector IV conversion connector ❸ respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

For CCD-FX410 series

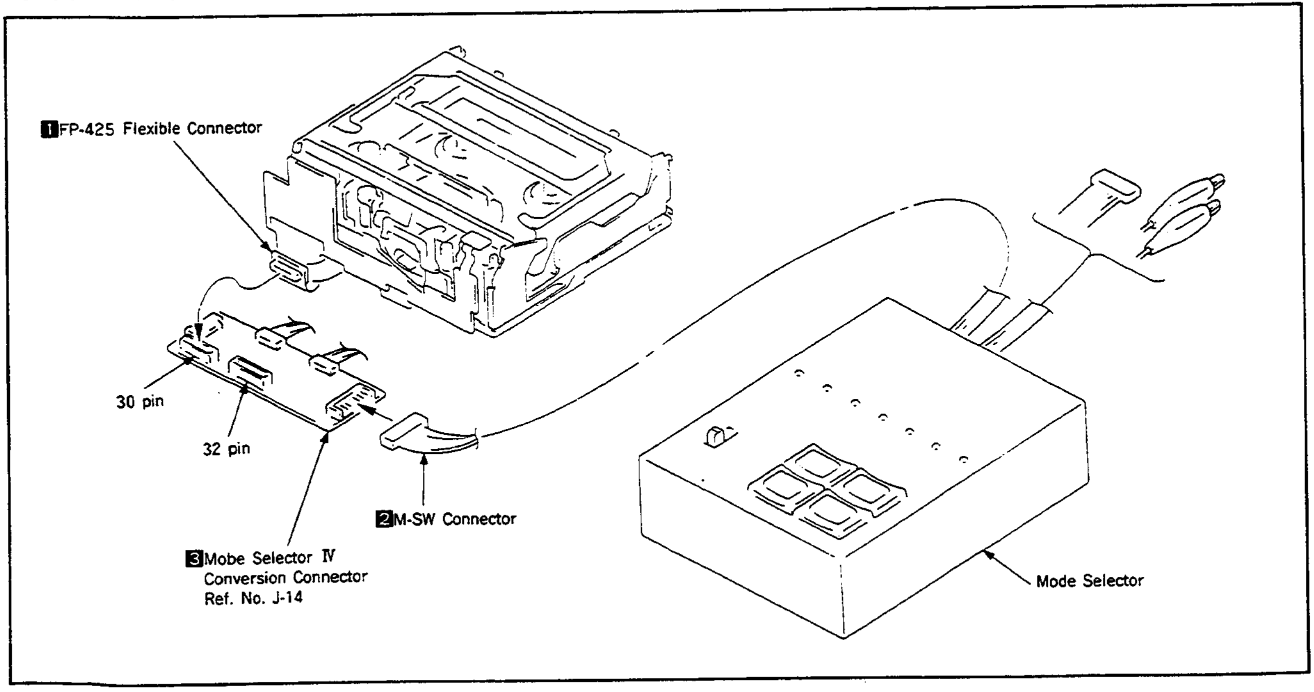
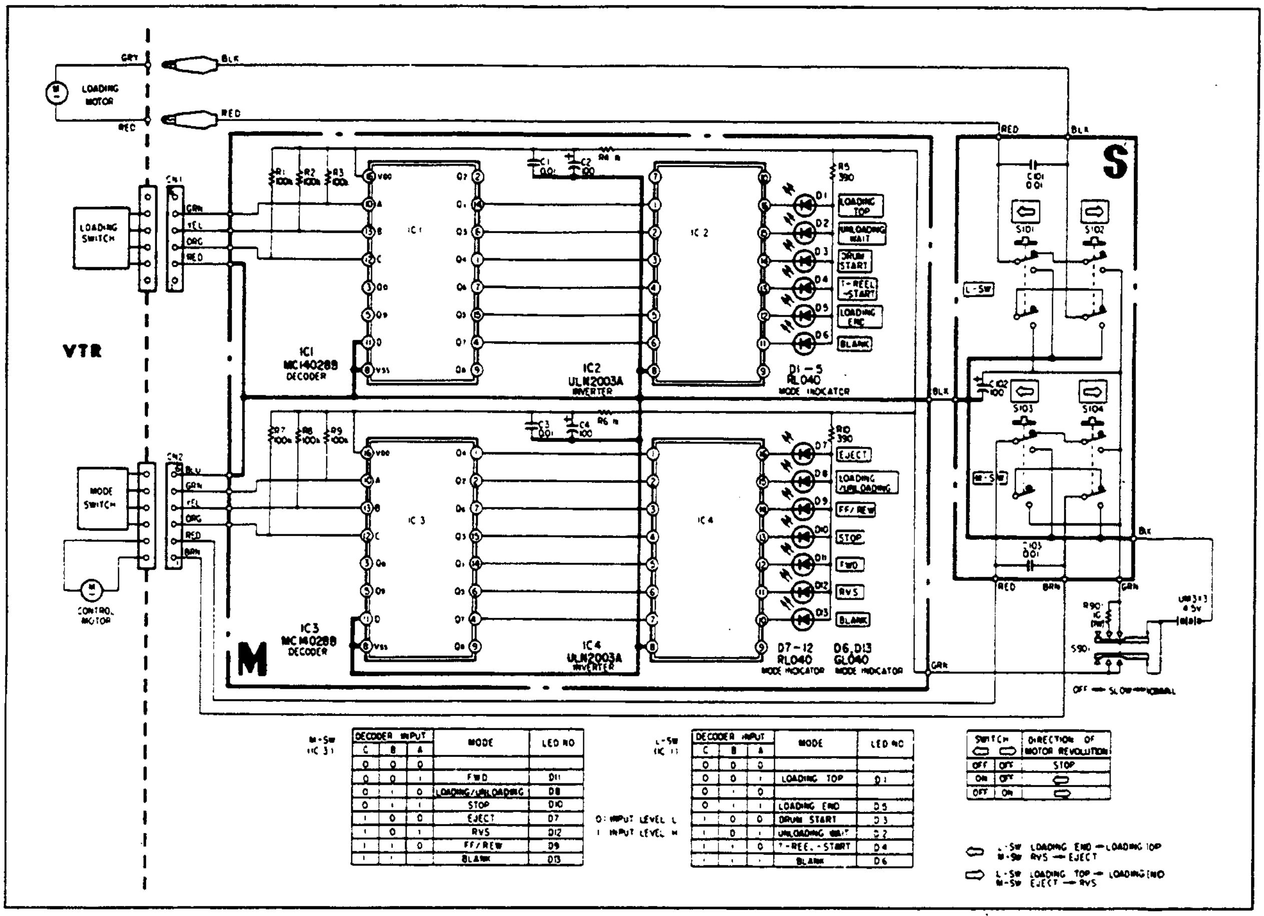

❶FP-425 Flexible Connector
30 pin
32 pin
❷M-SW Connector
❸Mobe Selector Ⅳ Conversion Connector Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
RED
LOADING MOTOR
CN1
LOADING SWITCH
GRN
YEL
ORG
RED
VTR
CN2
MODE SWITCH
BLU
BRN
CONTROL MOTOR
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
C1 .001
C2 100
C3 .001
C4 100
R1 100k
R2 100k
R3 100k
R4
R5 390
R6
R7 100k
R8 100k
R9 100k
R10 390
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL START
LOADING END
BLANK
D1–5 RL040 MODE INDICATOR
EJECT
LOADING/UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
D7–12 RL040 MODE INDICATOR
D6, D13 GL040 MODE INDICATOR
M
S
C101 .001
C102 100
C103 .001
S101
S102
S103
S104
L-SW
M-SW
R901
S901
OFF → SLOW → NORMAL
UM3×3 4.5V

M-SW (IC 3) DECODER INPUT C	B	A	MODE	LED NO
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1) DECODER INPUT C	B	A	MODE	LED NO
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH ⇦	SWITCH ⇨	DIRECTION OF MOTOR REVOLUTION
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-5. MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description		
		CAPACITOR		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V
		DIODE		
D1	8-719-812-31	DIODE TLR123		
D2	8-719-812-31	DIODE TLR123		
D3	8-719-812-31	DIODE TLR123		
D4	8-719-812-31	DIODE TLR123		
D5	8-719-812-31	DIODE TLR123		
D6	8-719-812-33	DIODE TLG123A		
D7	8-719-812-31	DIODE TLR123		
D8	8-719-812-31	DIODE TLR123		
D9	8-719-812-31	DIODE TLR123		
D10	8-719-812-31	DIODE TLR123		
D11	8-719-812-31	DIODE TLR123		
D12	8-719-812-31	DIODE TLR123		
D13	8-719-812-33	DIODE TLG123A		

Ref. No	Part No.	Description		
		IC		
IC1	8-752-240-28	IC TC4028BP		
IC2	8-752-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

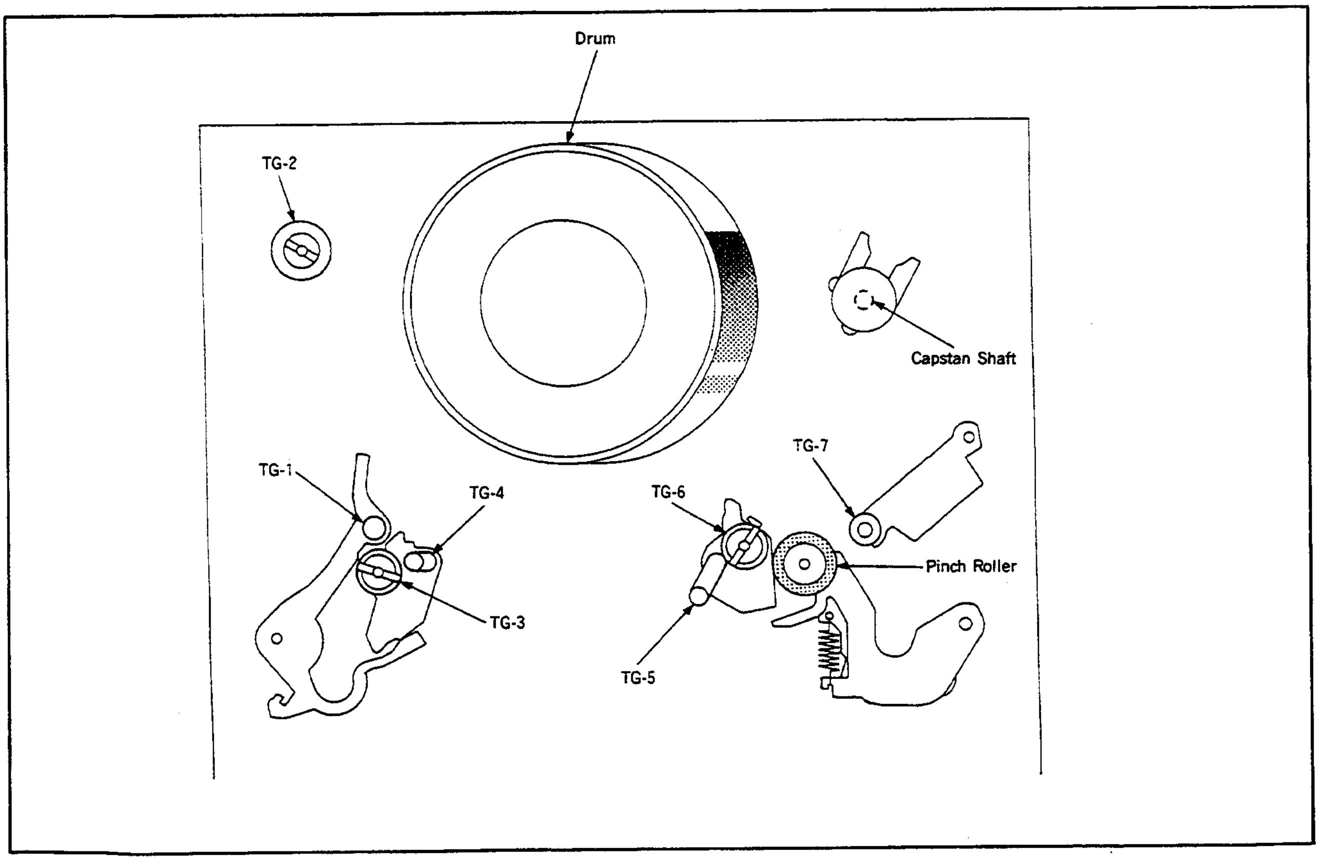


Fig. 7

2-3. PERILDIC CHECK ITEMS

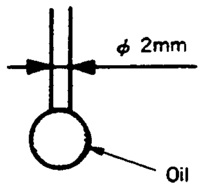
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

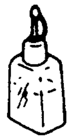


2-4. Service jigs list

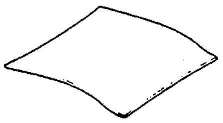
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅳ panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅳ conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment
- Oscilloscope
- Analog tester (20 kΩ)

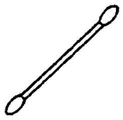
J-1



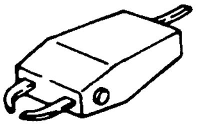
J-2



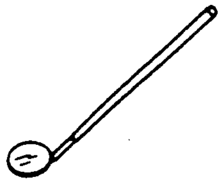
J-3



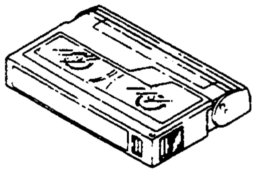
J-4



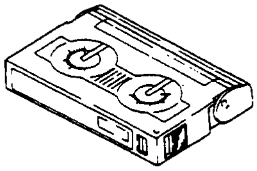
J-5



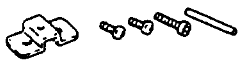
J-6



J-9

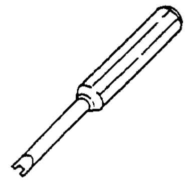


J-10

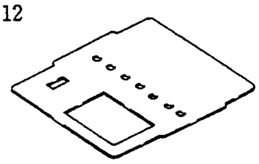


(Attached to the maintenance rotary upper drum)

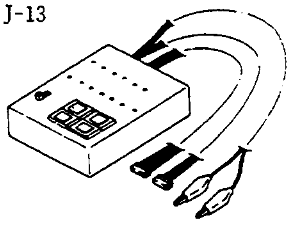
J-11



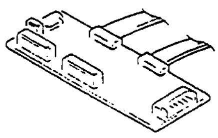
J-12



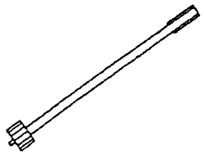
J-13



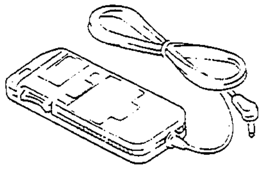
J-14



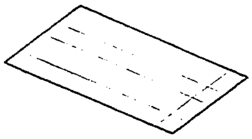
J-15



J-16



J-17



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw ❶.
3) Remove the Retainer, Gooseneck assembly ❷.

2. Mounting

1) Mount the Retainer, Gooseneck assembly ❷ with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

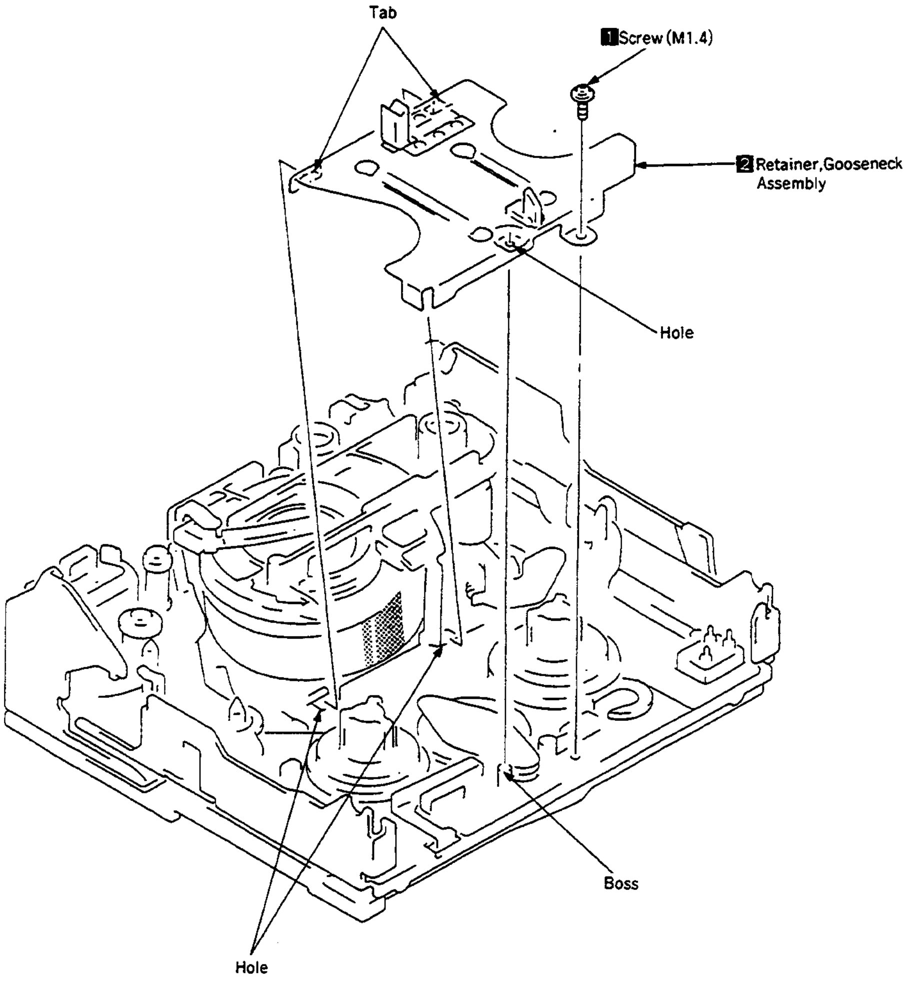


Fig. 8

3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws **1**, then the protector base assembly **2**.

2. Mounting

1) Mount the protector base assembly **2** with its three hole engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder **3**.
2) Tighten two screws **1**.
3) Referring to 1-1, mount the cassette compartment assembly.

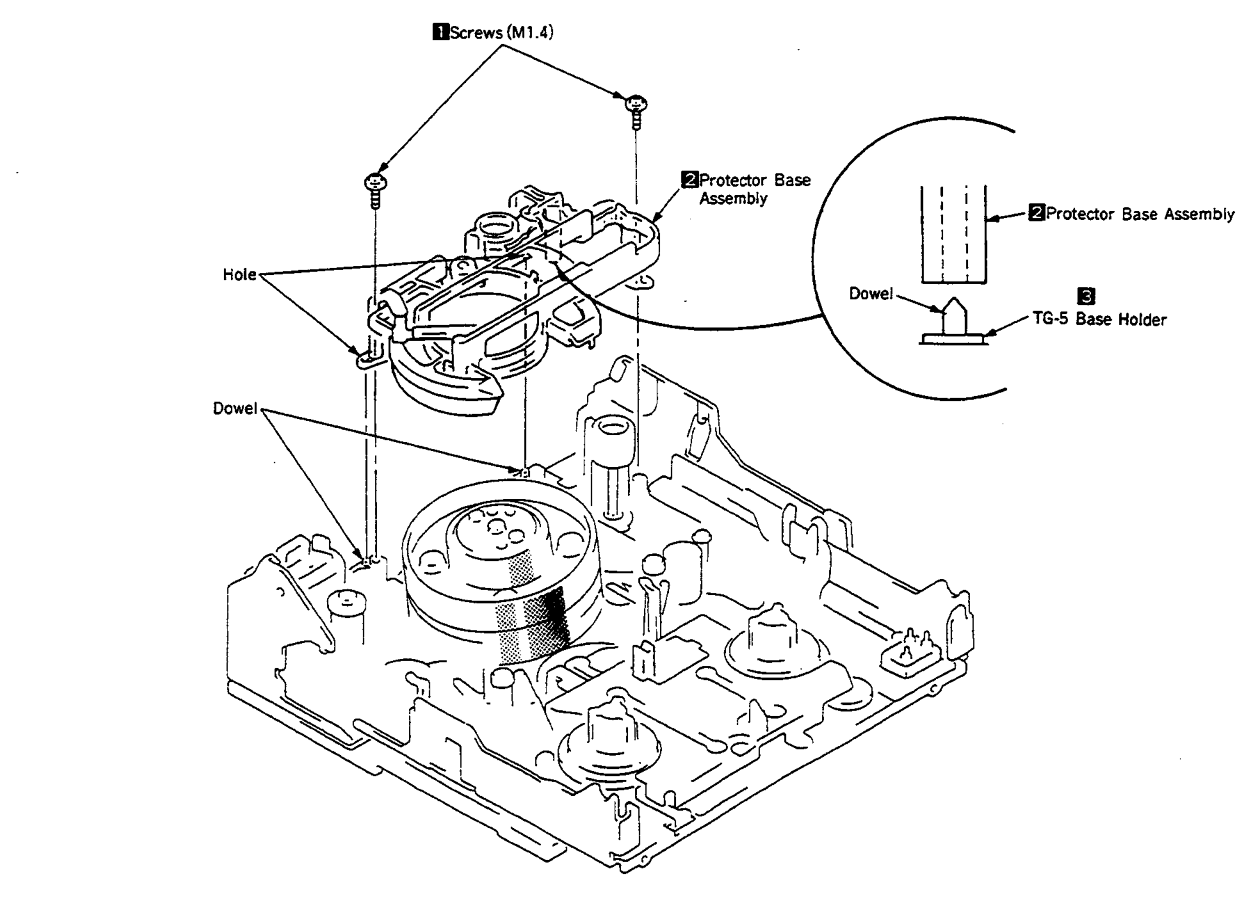

1 Screws (M1.4)
2 Protector Base Assembly
Hole
Dowel
2 Protector Base Assembly
Dowel
3 TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board ❶ on the back of MD.
4) Remove three screw ❷, then the drum assembly ❸.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2. Mounting

1) Mount the drum assembly ❸ while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2) Tighten three screw assemblies ❷ in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board ❶ on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

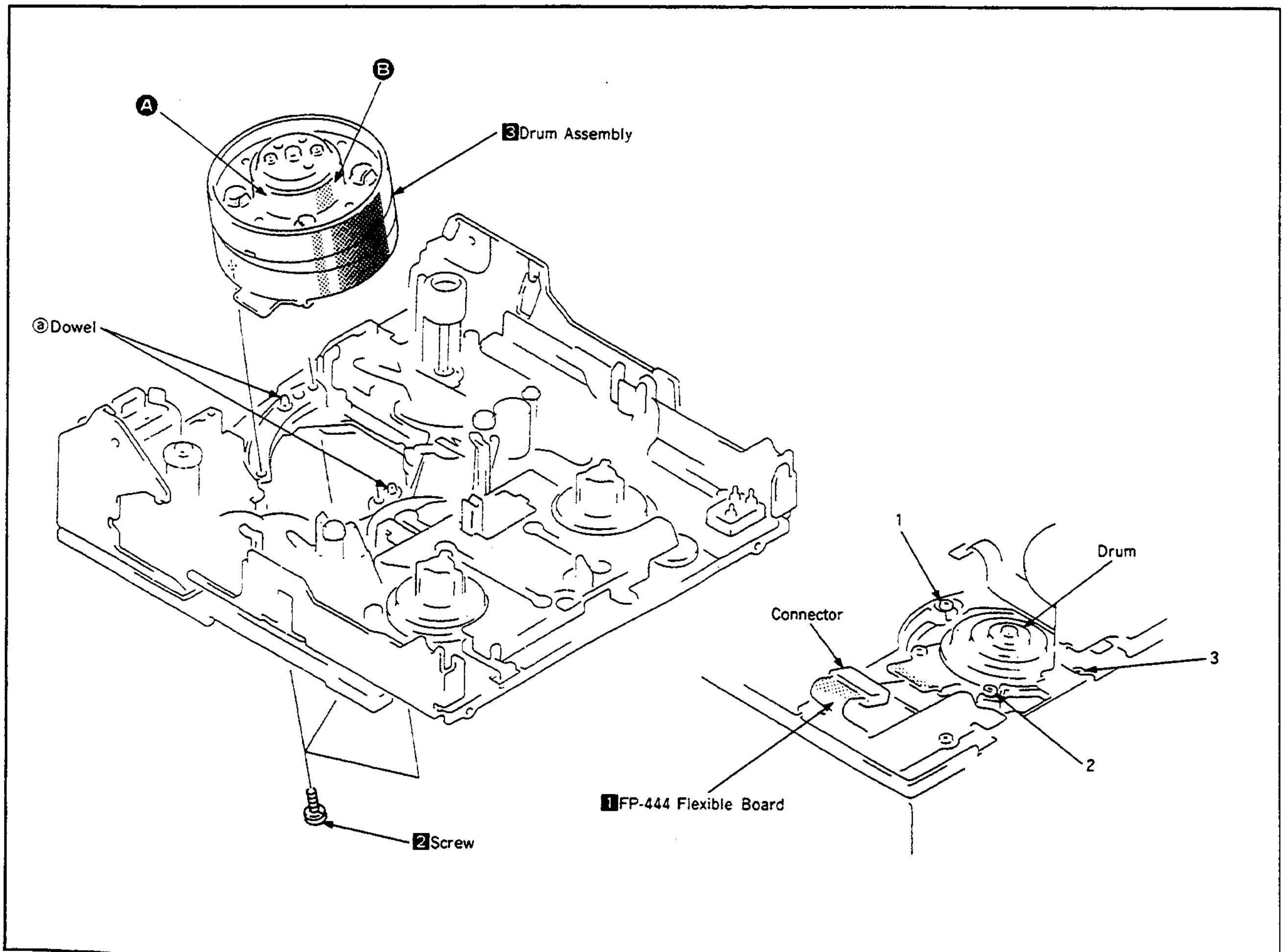


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw 1, then the capstan cover 2.
3) Remove the screw 3, then the capstan motor assembly 4.

2. Mounting

1) Mount the capstan motor assembly 4 and tighten the scre 3.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover 2 and tighten two screws 1.
3) Referring to 1-1, mount the cassette compartment assembly.

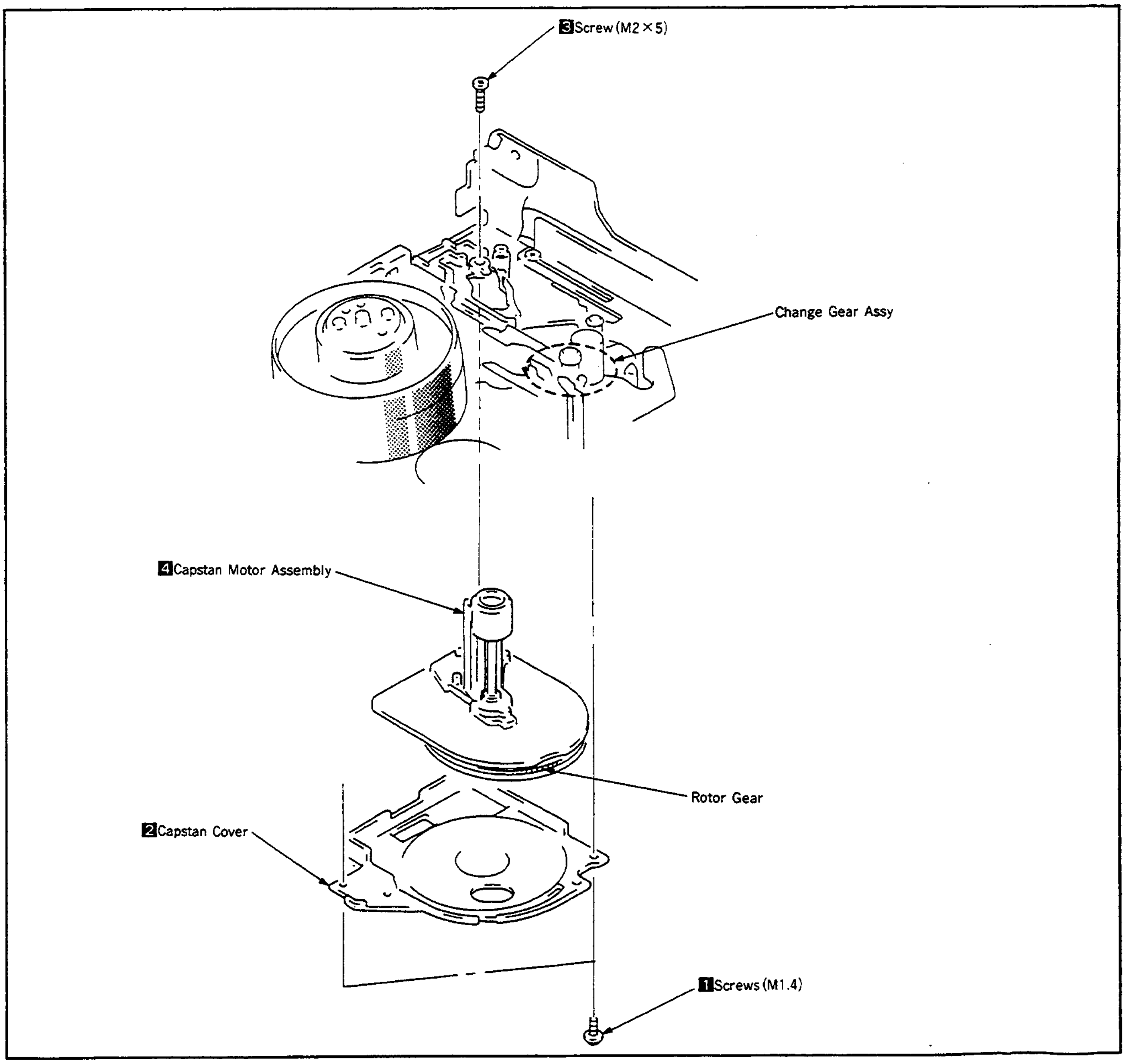

3 Screw (M2 × 5)
Change Gear Assy
4 Capstan Motor Assembly
Rotor Gear
2 Capstan Cover
1 Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly ❶.
4) Remove the T soft assembly ❷, then the T soft arm ❸.

2. Mounting

1) Mount the T soft arm ❸ with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly ❷ with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly ❶ and rotate it toward the arrow 🅐 to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

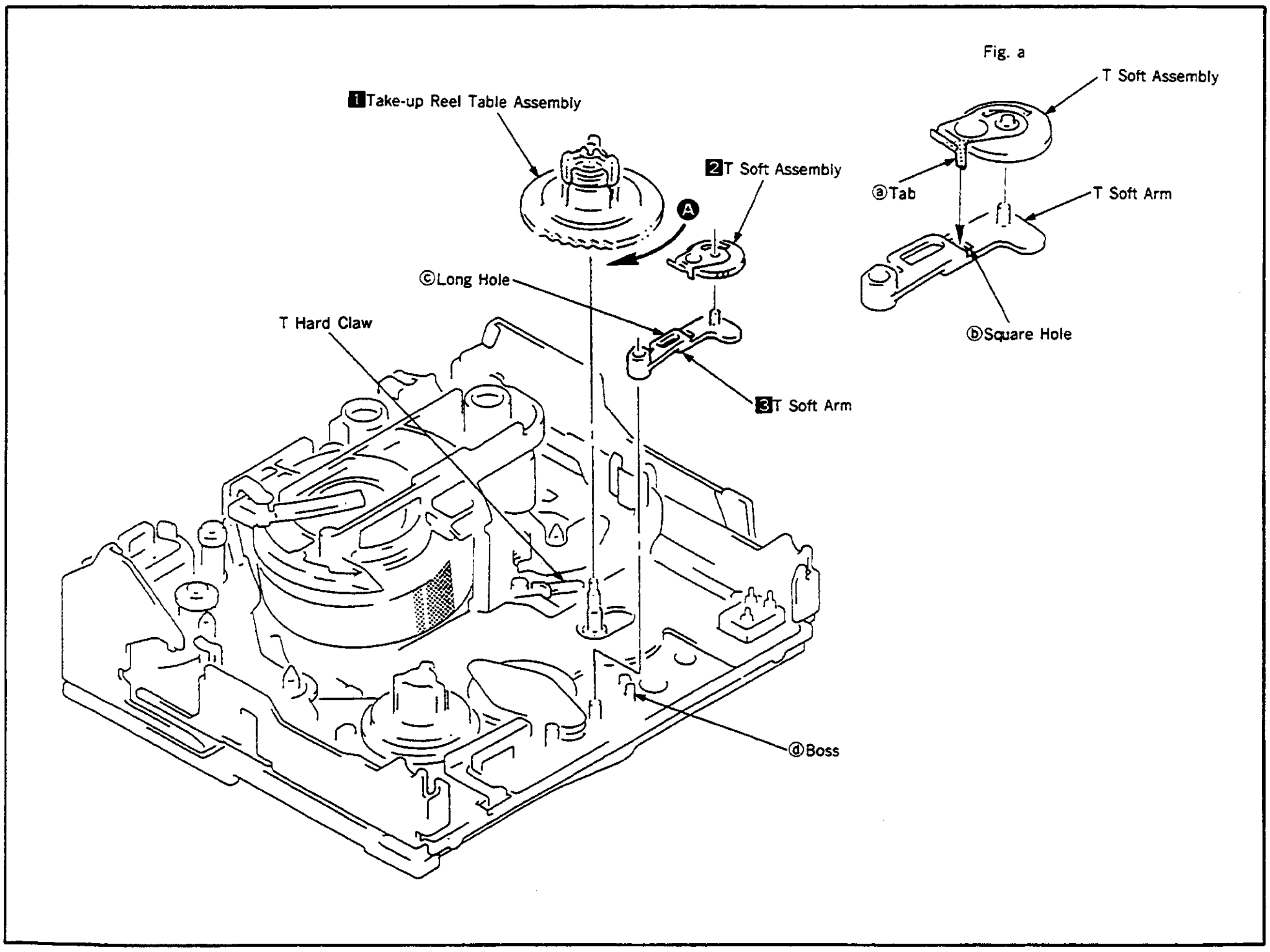

❶Take-up Reel Table Assembly
❷T Soft Assembly
🅐
ⓒLong Hole
T Hard Claw
❸T Soft Arm
ⓓBoss
Fig. a
T Soft Assembly
ⓐTab
T Soft Arm
ⓑSquare Hole

Fig. 12

3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the [READY] mode.
3) Remove a washer ❶, then the pinch arm assembly ❷.

2. Mounting

1) Select the [READY] mode.
2) Hooking a spring of pinch arm assembly ❷ to the casse positioning boss on the chassis, mount the pinch arm asser bly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss as shown in Fig. b.
4) Mount the washer ❶.
5) Referring to 1-1, mount the cassette compartment assembly.

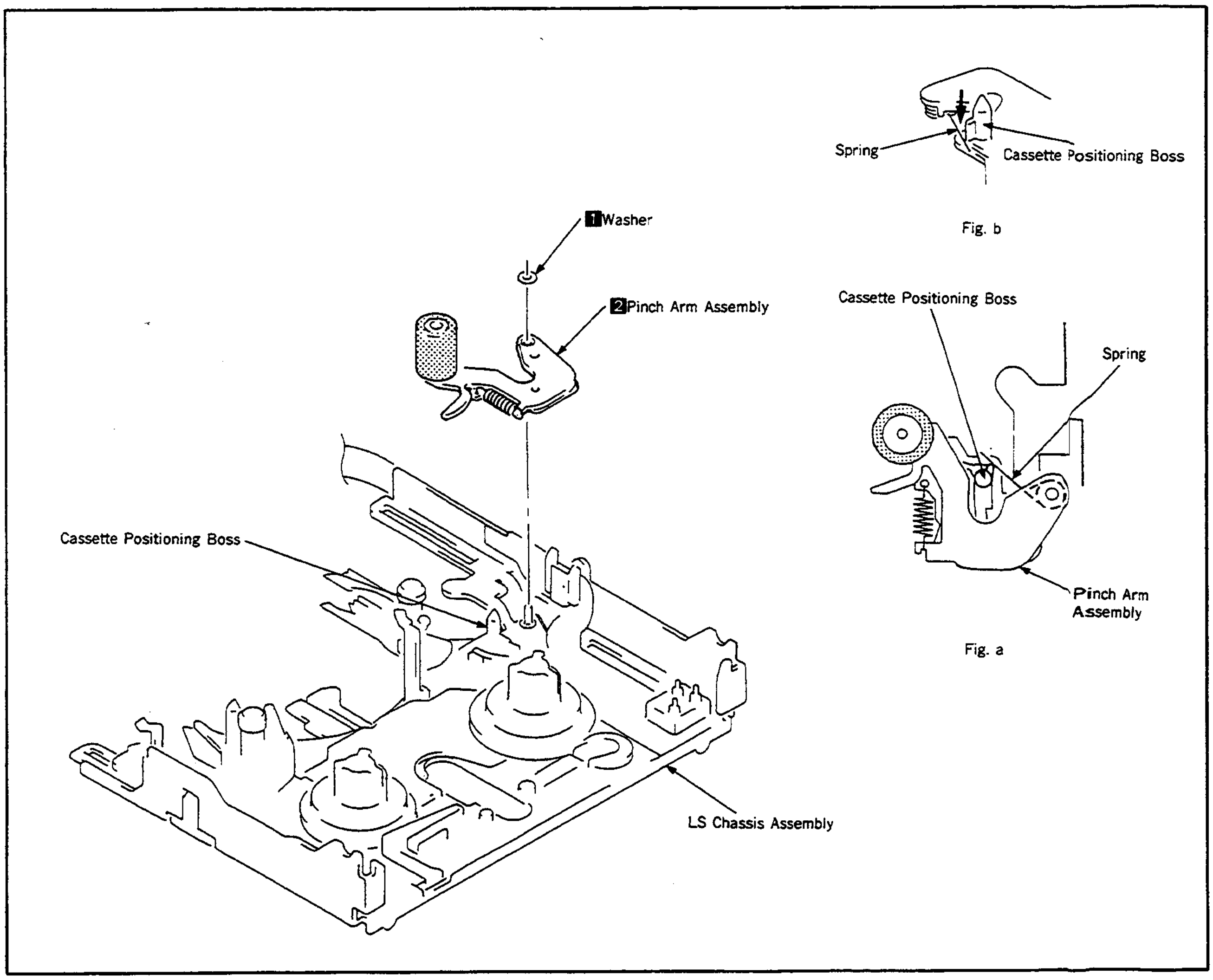

Spring
Cassette Positioning Boss
❶Washer
❷Pinch Arm Assembly
Cassette Positioning Boss
Spring
Pinch Arm Assembly
Cassette Positioning Boss
LS Chassis Assembly

Fig. b

Fig. a

Fig. 13

LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw ❶, TG-5 base holder ❷, and LS flexible board ❸.
5) Remove a lock washer ❹, then the gooseneck as sembly ❺.
6) Remove four screws ❻, then the LS chassis assembly ❼.

2. Mounting

1) Select the $\boxed{\text{USE}}$ mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly ❼ on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws ❻.
6) Mount the LS flexible board ❸ and TG-5 base holder ❷,then tighten the screw ❶.
7) Mount the Gooseneck assembly ❺ and fix it with a washer ❹.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.

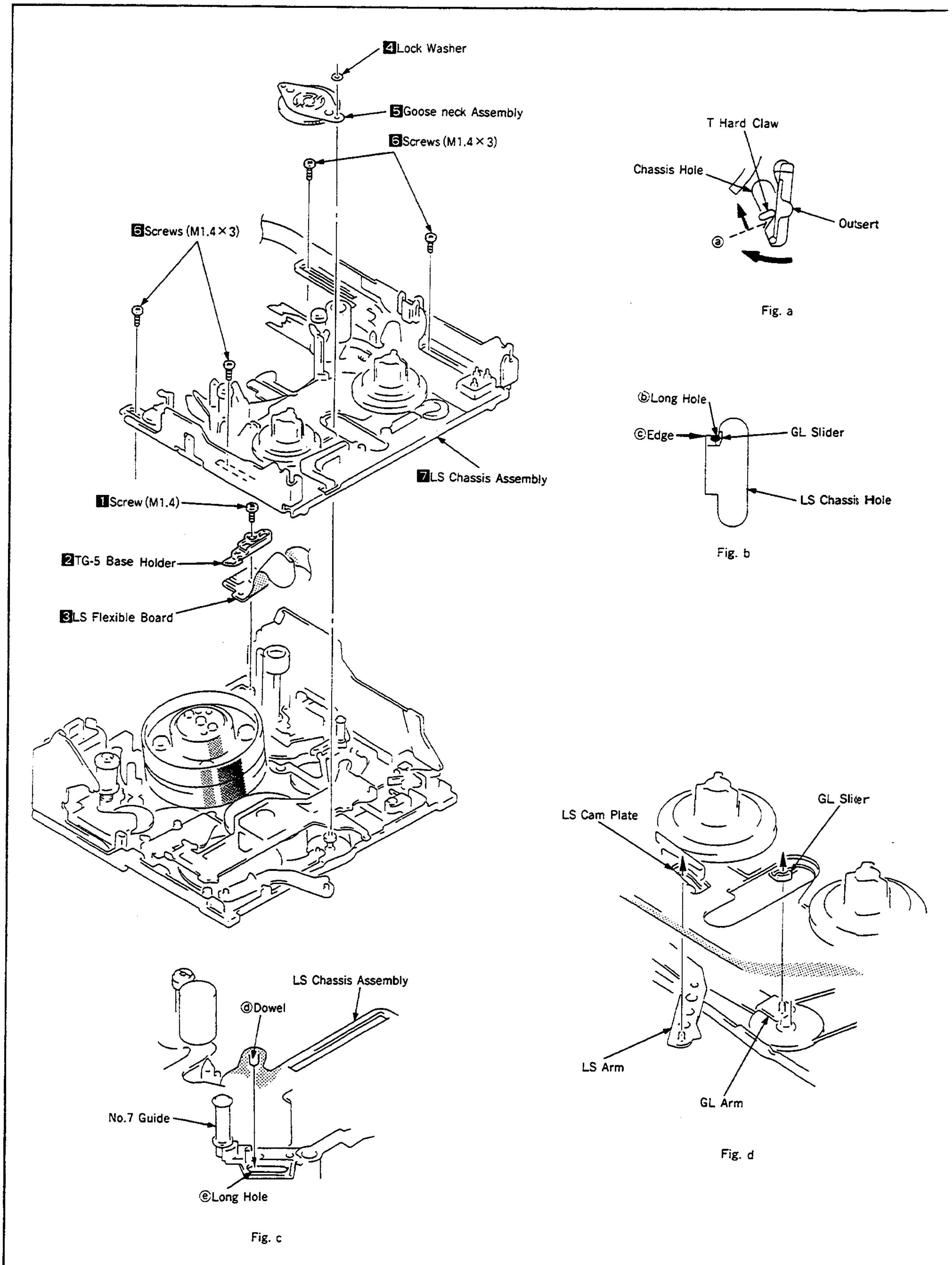

❹Lock Washer
❺Goose neck Assembly
❻Screws (M1.4×3)
❻Screws (M1.4×3)
❼LS Chassis Assembly
❶Screw (M1.4)
❷TG-5 Base Holder
❸LS Flexible Board
T Hard Claw
Chassis Hole
Outsert
ⓐ
ⓑLong Hole
ⓒEdge
GL Slider
LS Chassis Hole
LS Cam Plate
GL Slider
LS Arm
GL Arm
LS Chassis Assembly
ⓓDowel
No.7 Guide
ⓔLong Hole

Fig. a

Fig. b

Fig. c

Fig. d

Fig. 14

3- GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider 1 toward the arrow Ⓐ, and remove the guide base T assembly 2 and guide base S assembly 3 from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly 2 and guide base S assembly 3 respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly 2 and guide base S assembly 3 respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly 4, guide arm S assembly 5 and GL slider 1 from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly 2 and guide base S assembly 3 with the respective guide rails, push in the GL slider 1 toward the arrow Ⓑ as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

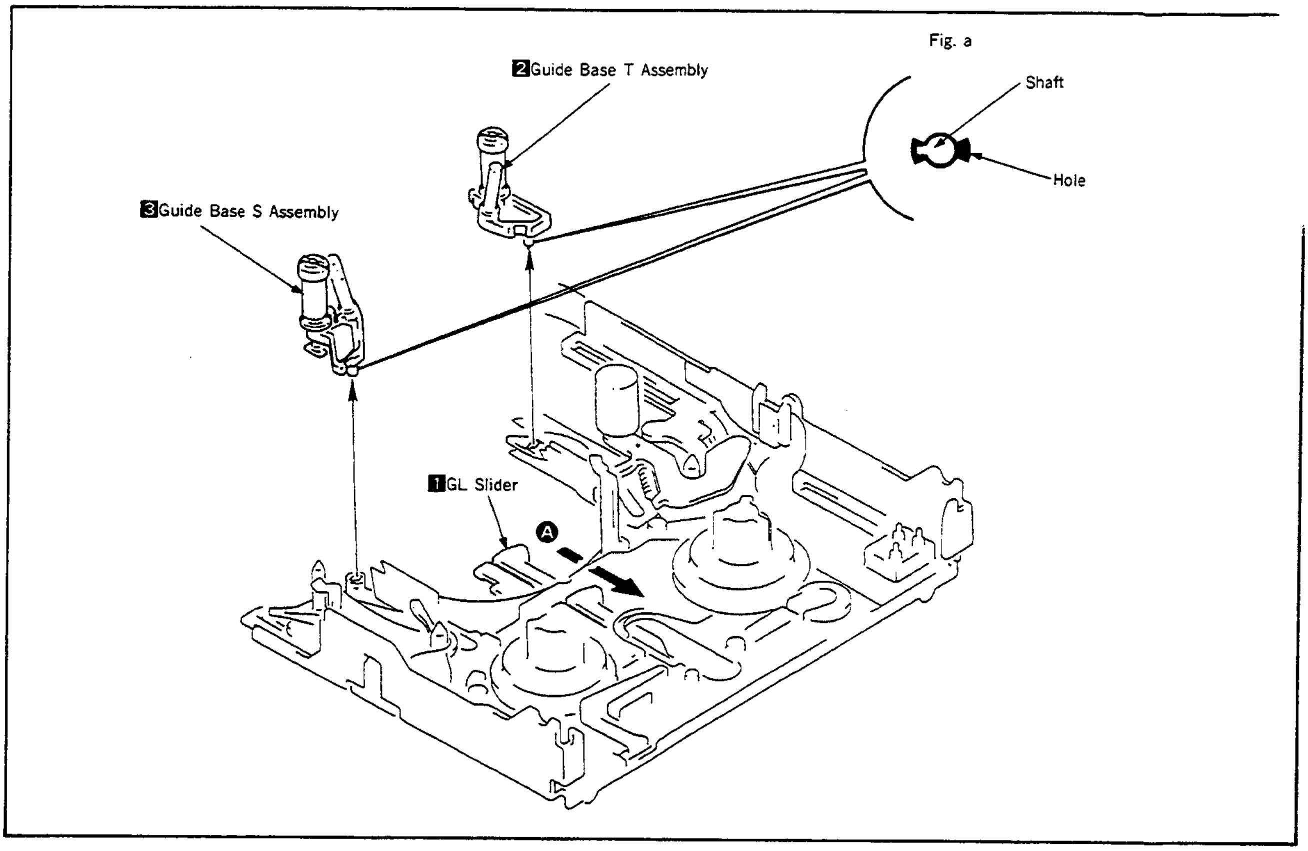


Fig. a
2 Guide Base T Assembly
Shaft
Hole
3 Guide Base S Assembly
1 GL Slider
A

Fig. 15

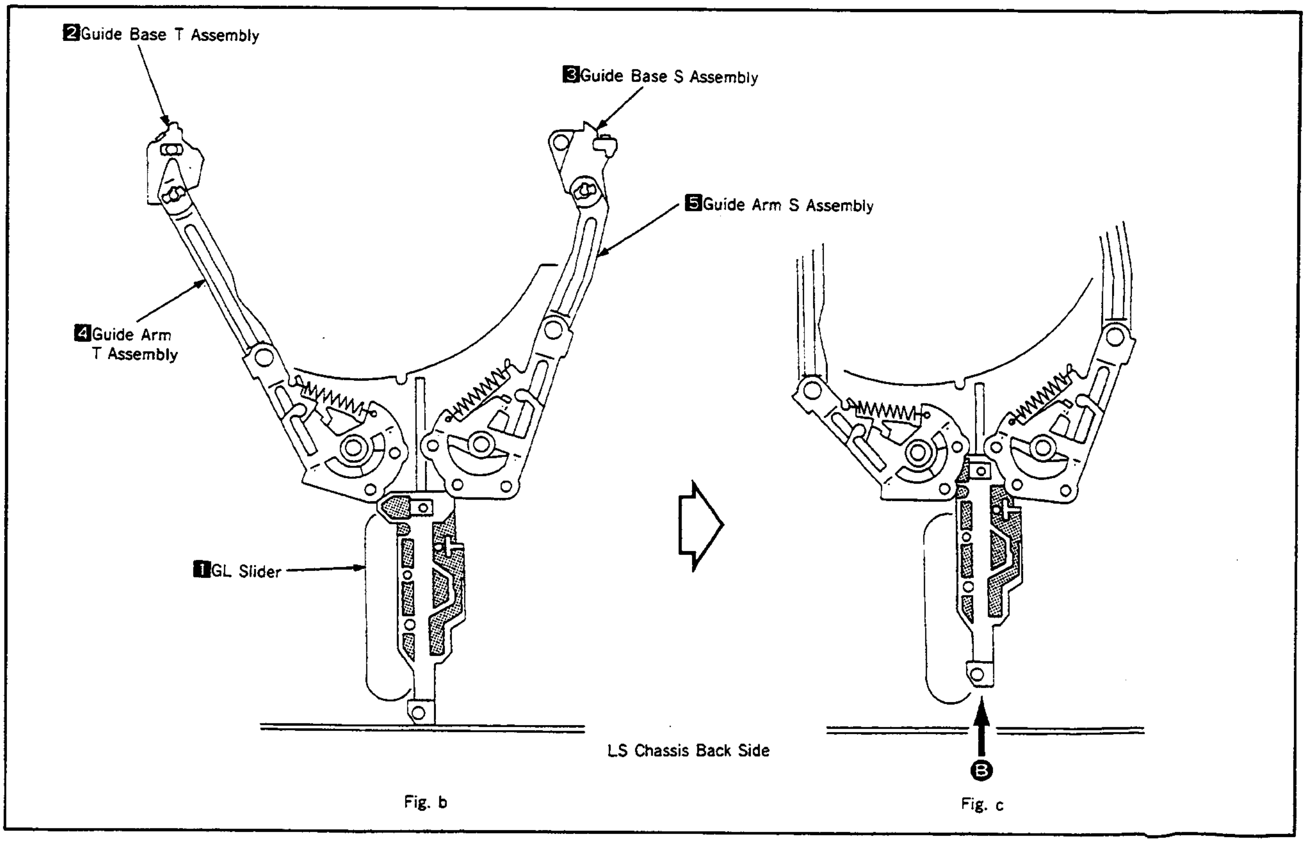

2 Guide Base T Assembly
3 Guide Base S Assembly
5 Guide Arm S Assembly
4 Guide Arm T Assembly
1 GL Slider
LS Chassis Back Side
B

Fig. b

Fig. c

Fig. 16

GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers ❶, then the guide arm T assembly ❷ and guide arm S assembly ❸ respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly ❷ and guide arm S assembly ❸, then fix them with a lock washer ❶ respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guide-base S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

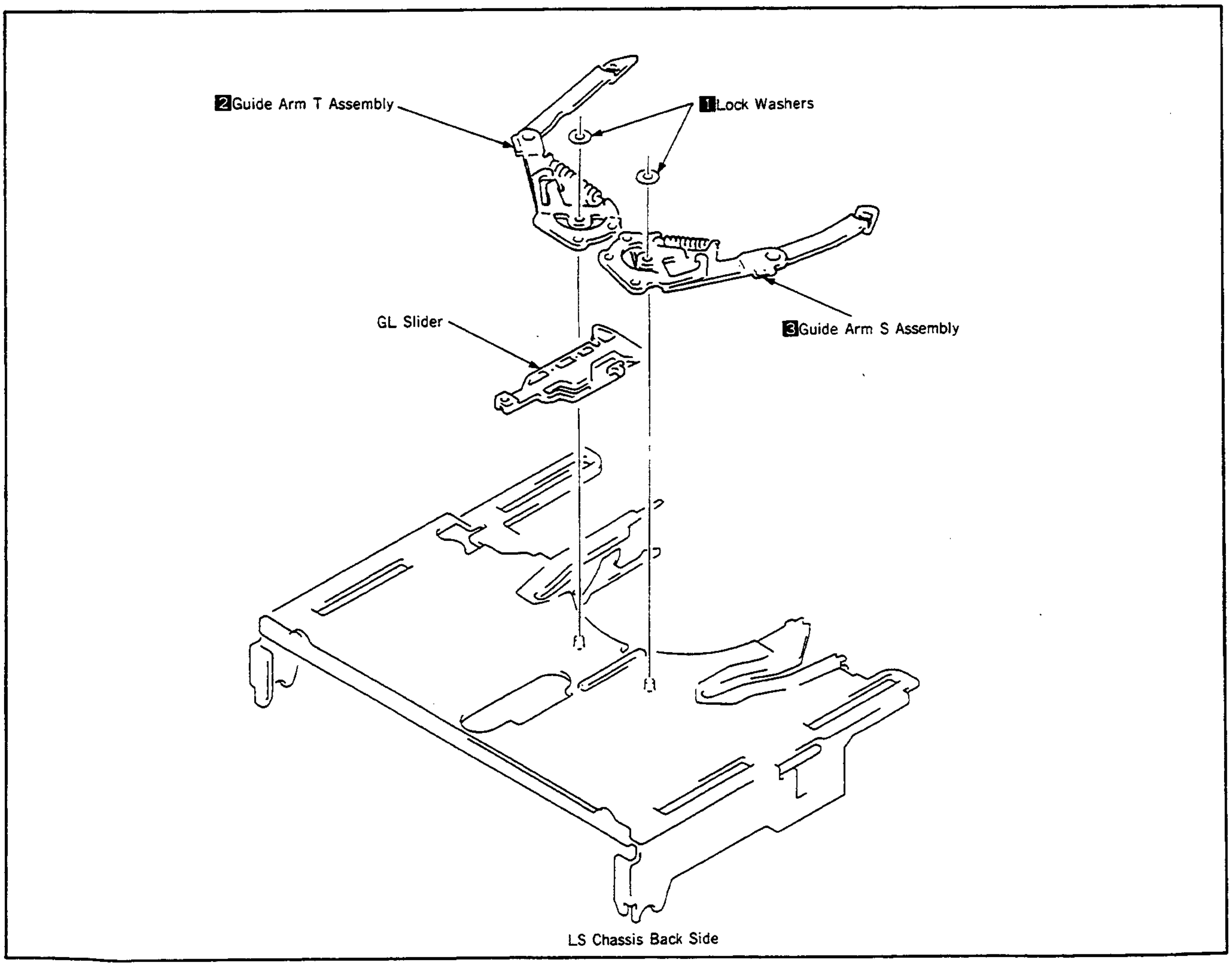


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw ❶, then the string ❷ from the supply reel table assembly ❸. For easy removal of string block ❹, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly ❸.
8) Remove a tension coil spring ❺.
9) Turn the TG-1 arm assembly ❻ up to a portion ⓒ of LS chassis hole in the arrow Ⓐ direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake ❼ toward the arrow Ⓑ, mount thesupply reel table assembly ❸.
2) Route the string ❷ under the TG-1 arm asembly ❻, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow Ⓐ (Fig. b).
3) Wind the string ❷ along the groove of supply reel t assembly ❸ (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), shift the string block ❹ toward the arrow Ⓒ and tighten the screw ❶ (Fig. a).
5) Engage the tension coil spring ❺ to the chassis hook.

Note : Confirm that the string ❷ is surely wound around the groove of supply reel table assembly ❸ (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm. (Refer to 3-5 Take-up Reel Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembly.

Note : Referring to 3-22, adjust the tension regulator position.

Note : Referring to 3-23, adjust the forward back tension.

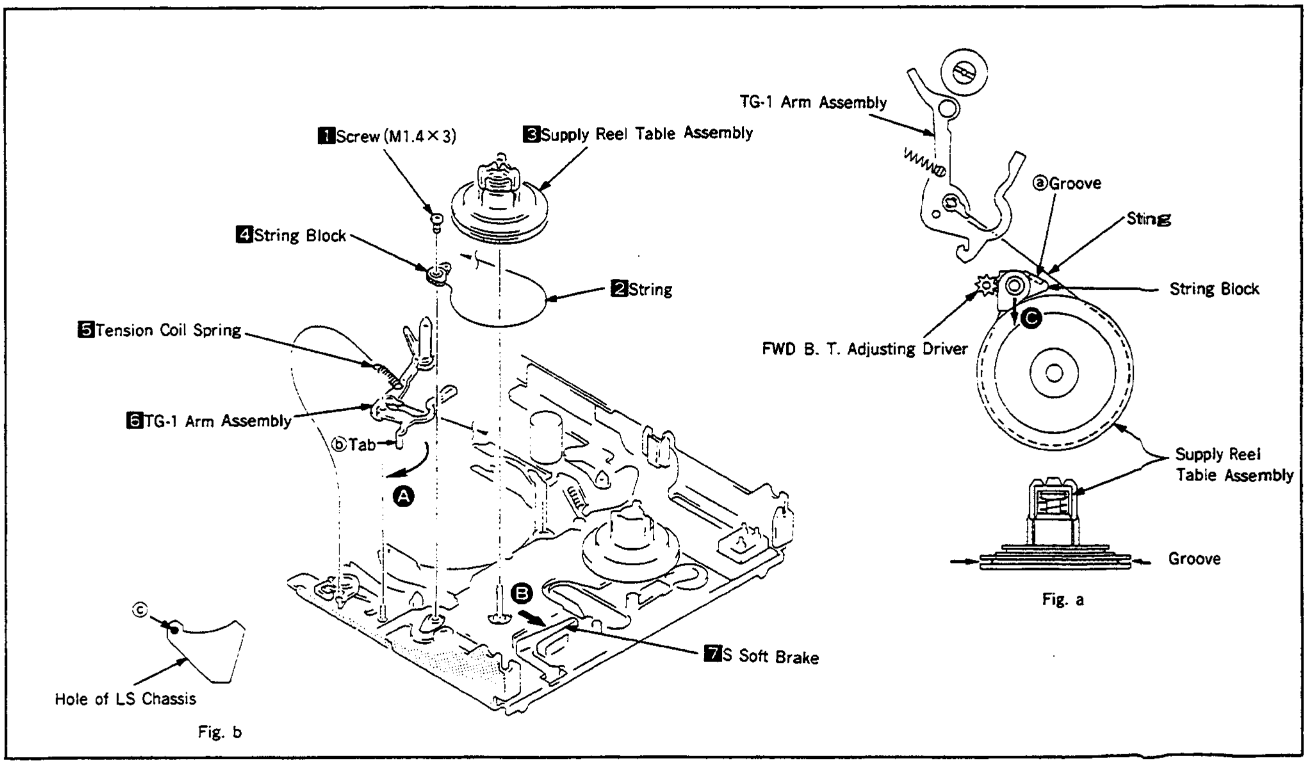

❶Screw (M1.4×3)
❸Supply Reel Table Assembly
❹String Block
❷String
❺Tension Coil Spring
❻TG-1 Arm Assembly
ⓑTab
Ⓐ
Ⓑ
❼S Soft Brake
ⓒ
Hole of LS Chassis
Fig. b
TG-1 Arm Assembly
ⓐGroove
Sting
String Block
Ⓒ
FWD B. T. Adjusting Driver
Supply Reel Table Assembly
Groove
Fig. a

Fig. 18

3 . TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly 1 .
2) Remove a compression coil spring 2 .

2.Mounting

1) Insert a compression coil spring 2 into the boss on chassis.
2) Rotate gently the TG-2 roller assembly 1 until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.

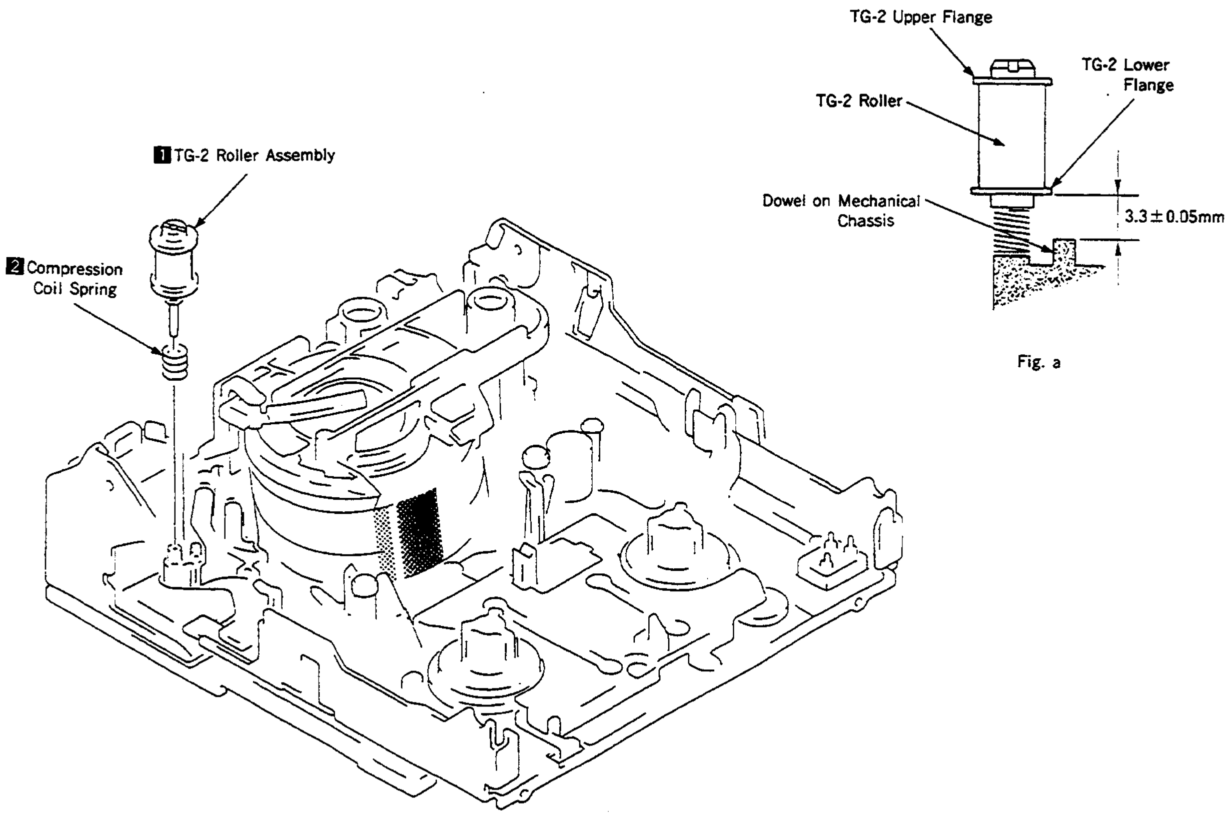

1 TG-2 Roller Assembly
2 Compression Coil Spring
TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm
Fig. a

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring **1** in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly **2** from the shaft of mechanical-chassis.

2. Mounting

1) Mount the TG-7 arm assembly **2** to the shaft of mechanic chassis.
2) Mount the TG-7 arm Leaf spring **1** to the mechanicalchassis.
   * Push in the tab of Leaf spring until it clicks into a detent ofchassis (Fig. a).
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

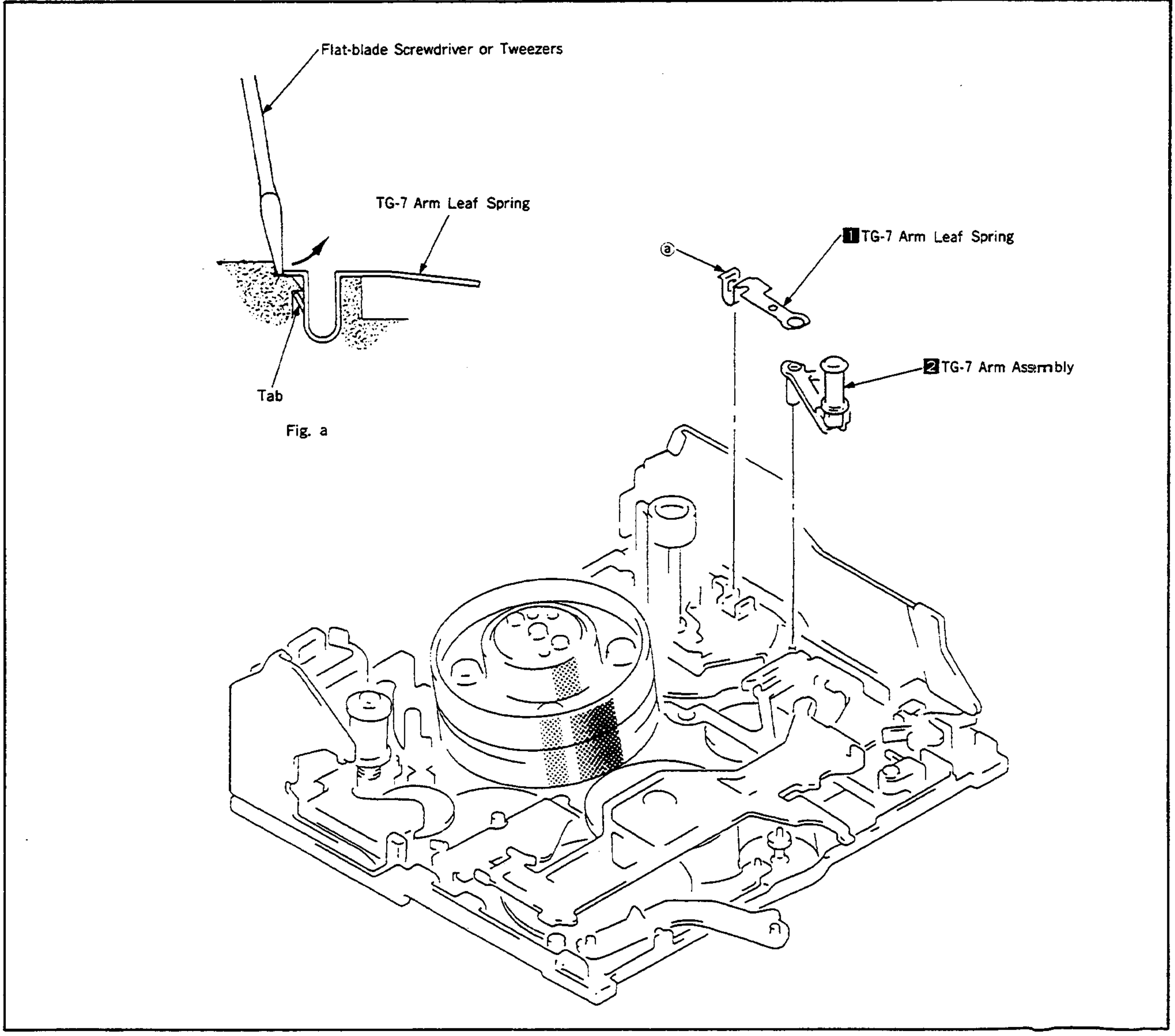


Fig. 20

3 . LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the LOAD mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

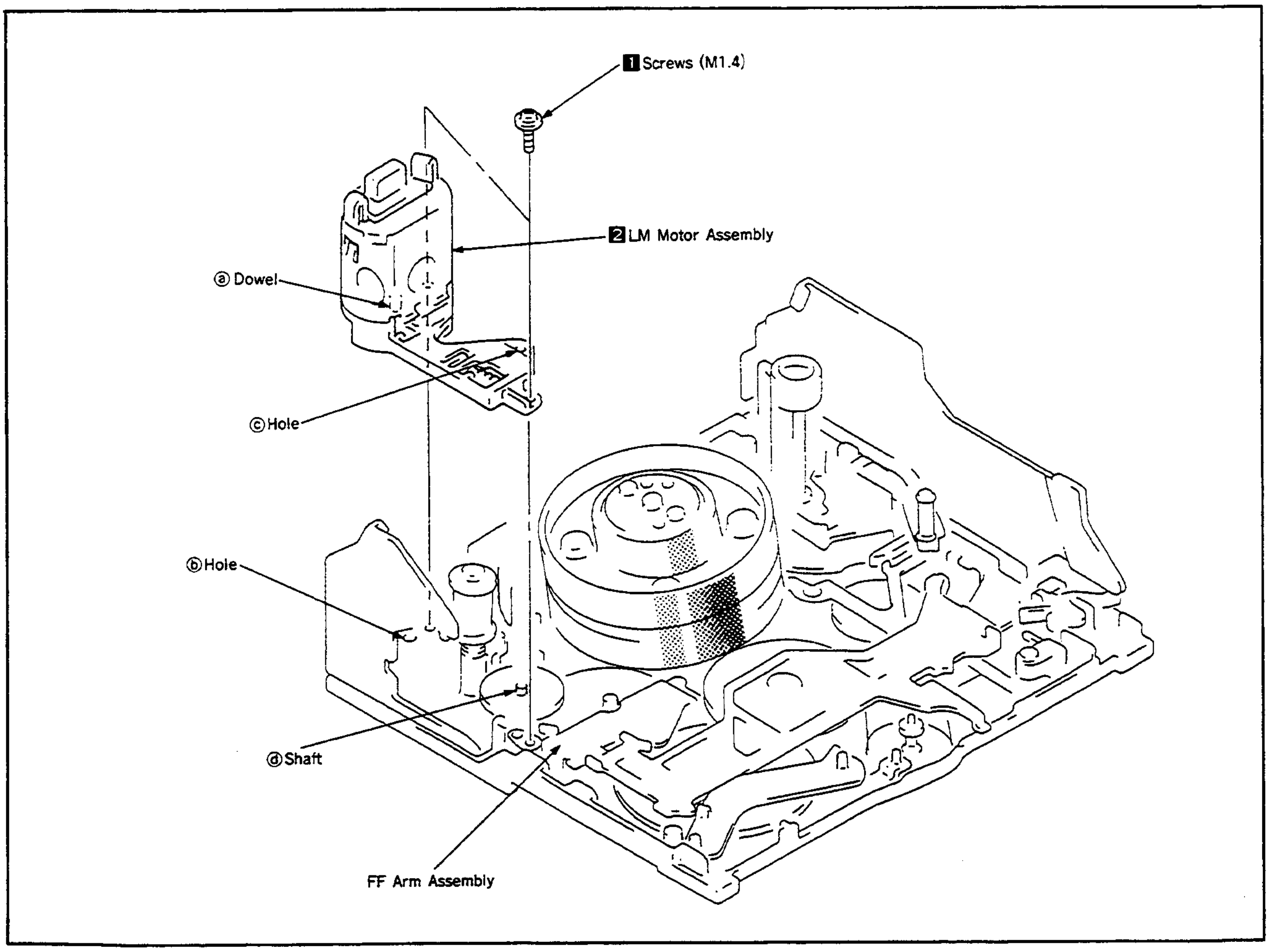


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm ❶ from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller ❷.

2. Mounting

1) Mount the LS arm ❶ meeting with mechanical chassis sh and cam groove.

Note : Move the LS arm ❶ in arrow direction to confirm that the LS roller ❷ is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

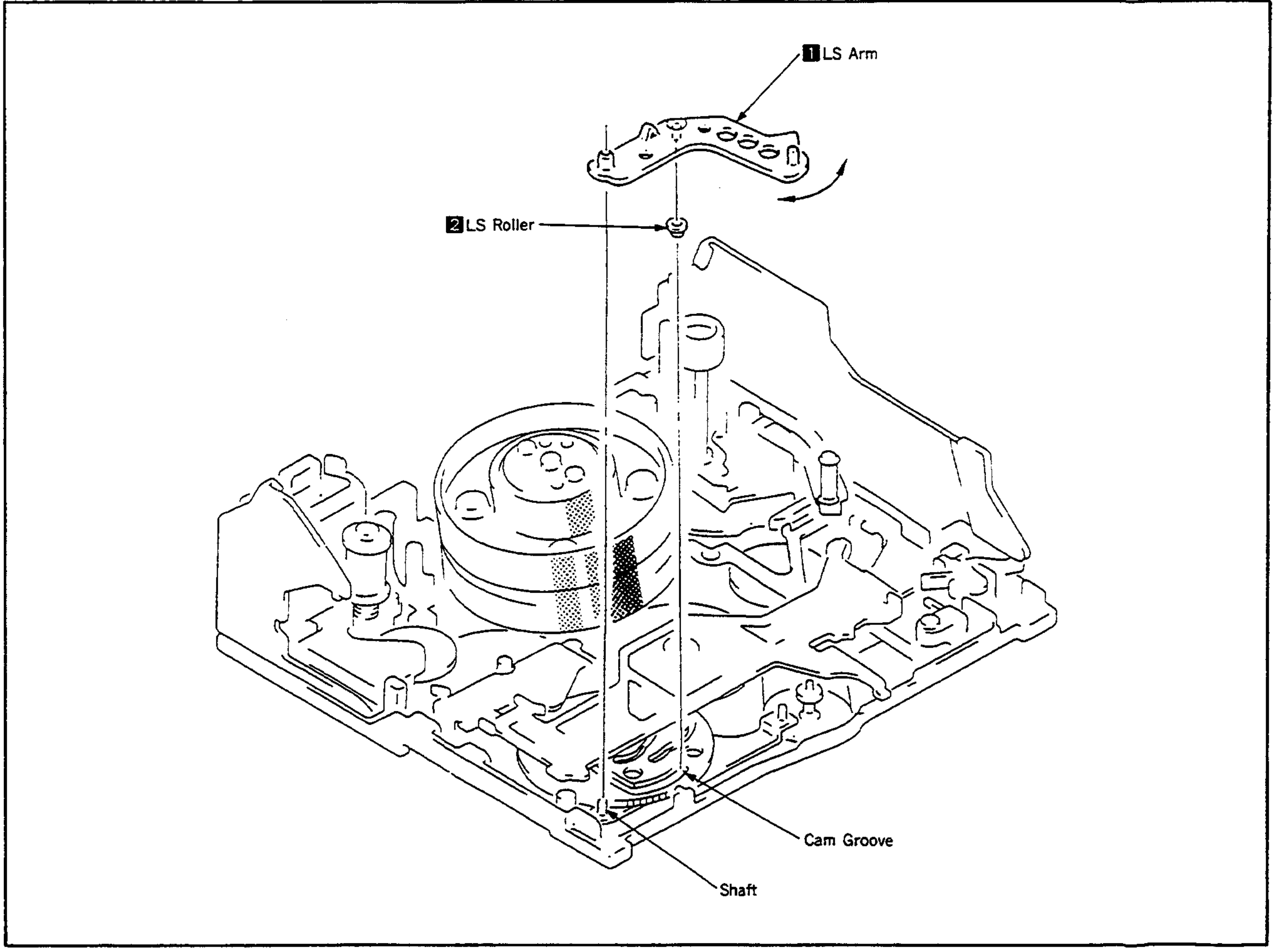


Fig. 22

. M SLIDER ASSEMBLY (Fig. 23)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

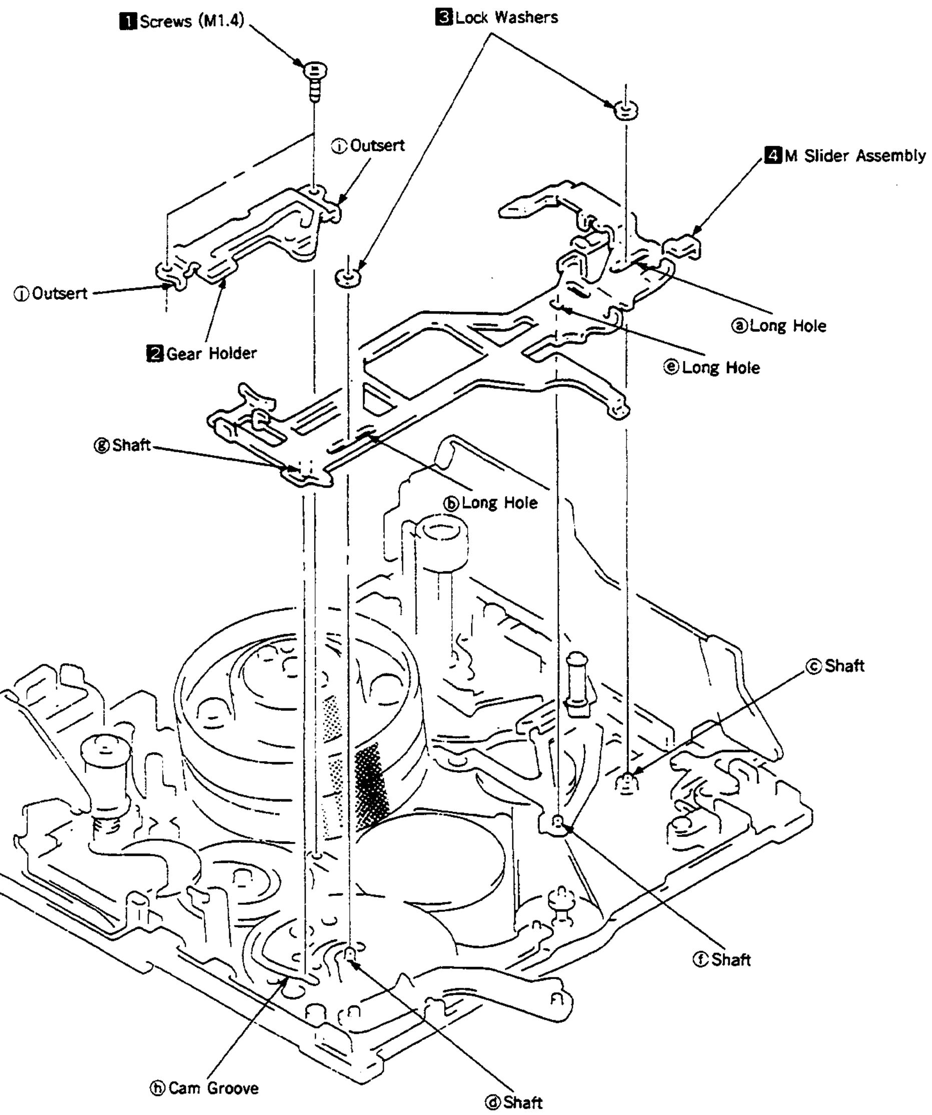

❶ Screws (M1.4)
❸ Lock Washers
ⓘ Outsert
❹ M Slider Assembly
ⓙ Outsert
ⓐ Long Hole
❷ Gear Holder
ⓔ Long Hole
ⓖ Shaft
ⓑ Long Hole
ⓒ Shaft
ⓕ Shaft
ⓗ Cam Groove
ⓓ Shaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer ❶, then pinch press arm assembly ❷.

2.Mounting

1) Mounting the pinch press arm assembly ❷, inserting its sh ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ in the shaft ⓓ of mechanical chassis.
2) Mount the lock washer ❶.
3) After mounting, shift the pinch press arm assembly toward the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

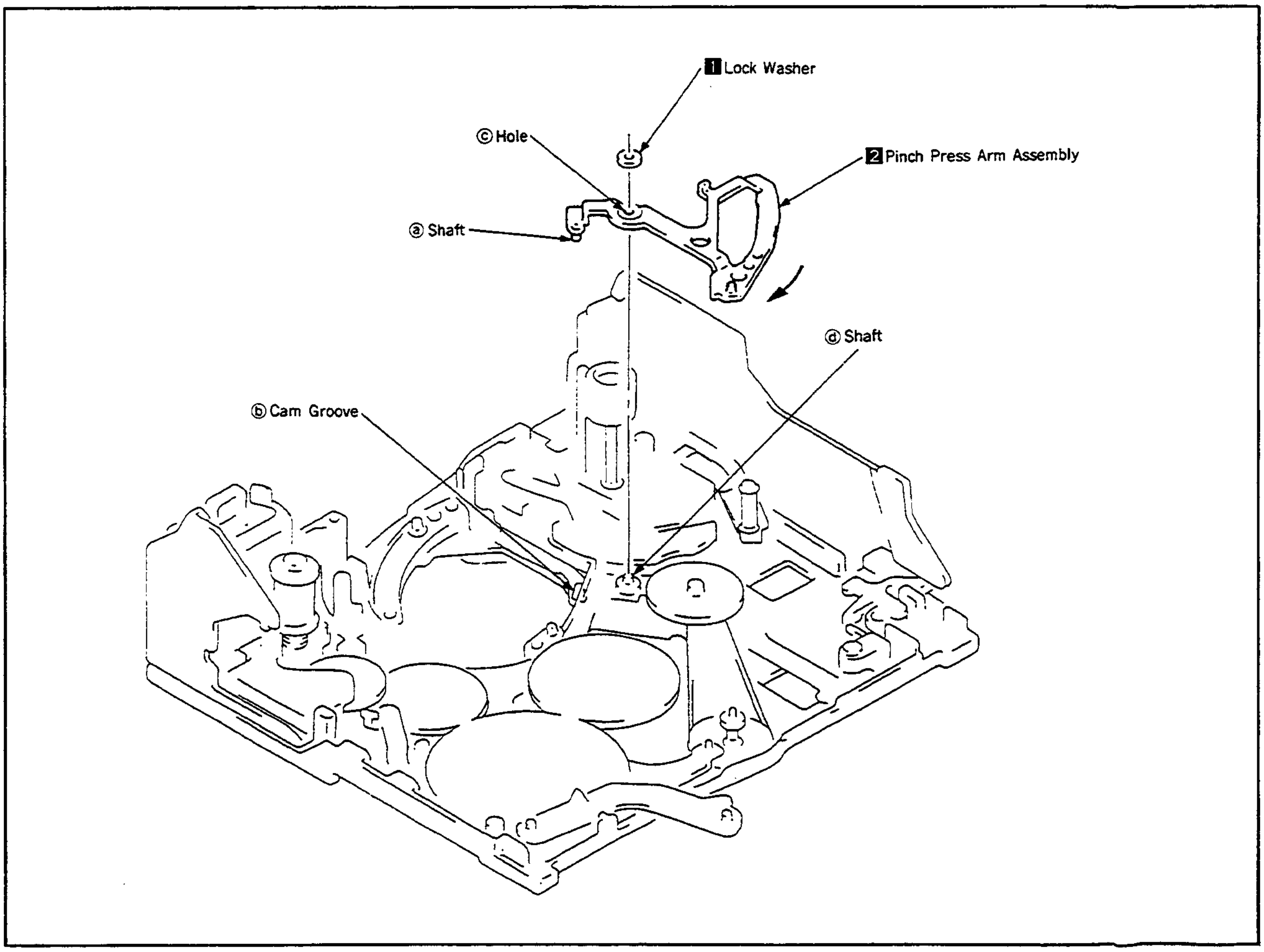


Fig. 24

. CAM (Fig. 25)

emoval

Referring to 1-1, remove the cassette compartment assembly.
Referring to 3-1, remove the Retainer, Gooseneck assembly.
Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam **1**.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam **1**, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

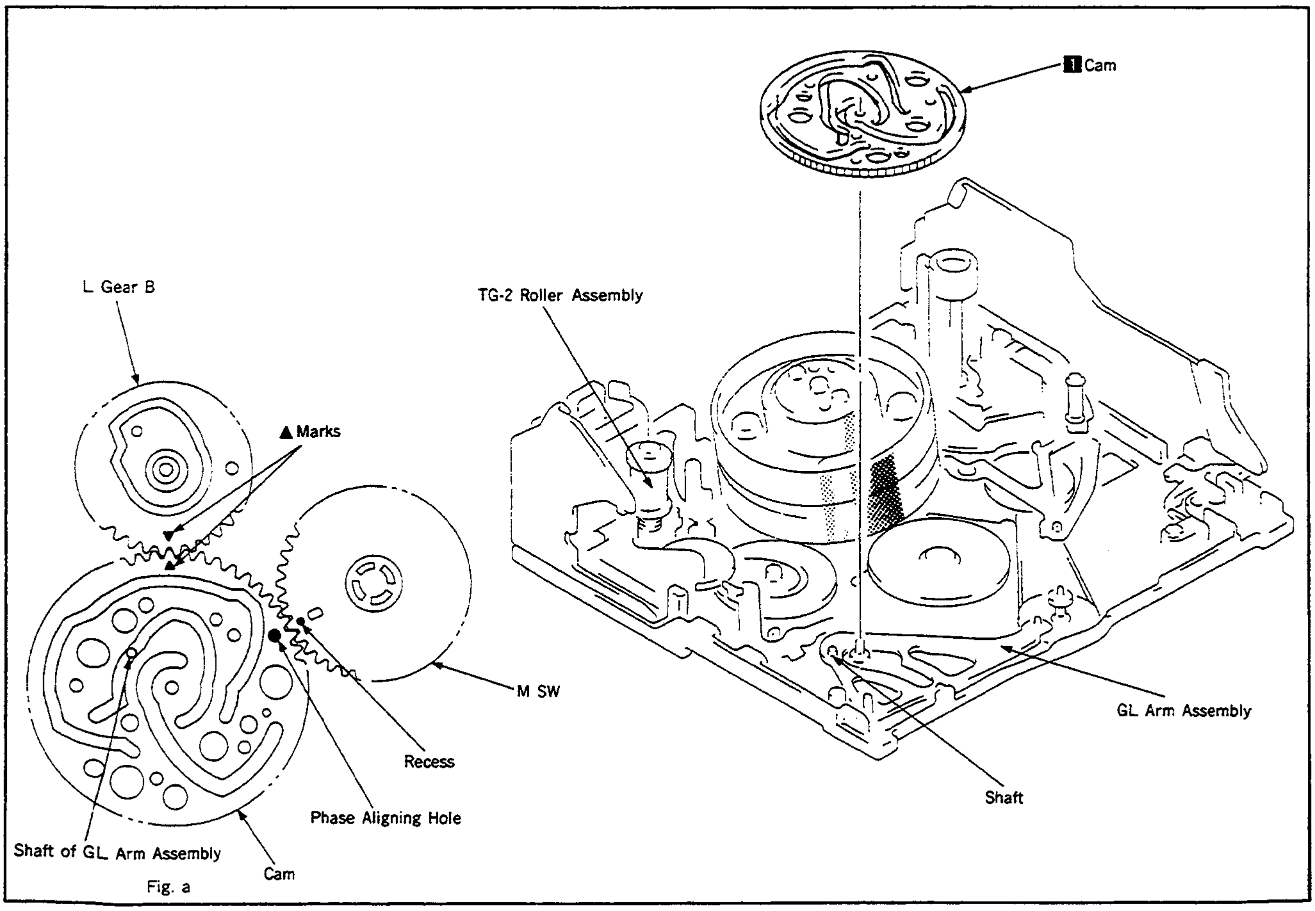


Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly ❶.

2. Mounting

1) Mount the GL arm assembly ❶ with its hole ⓐ inserted in the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

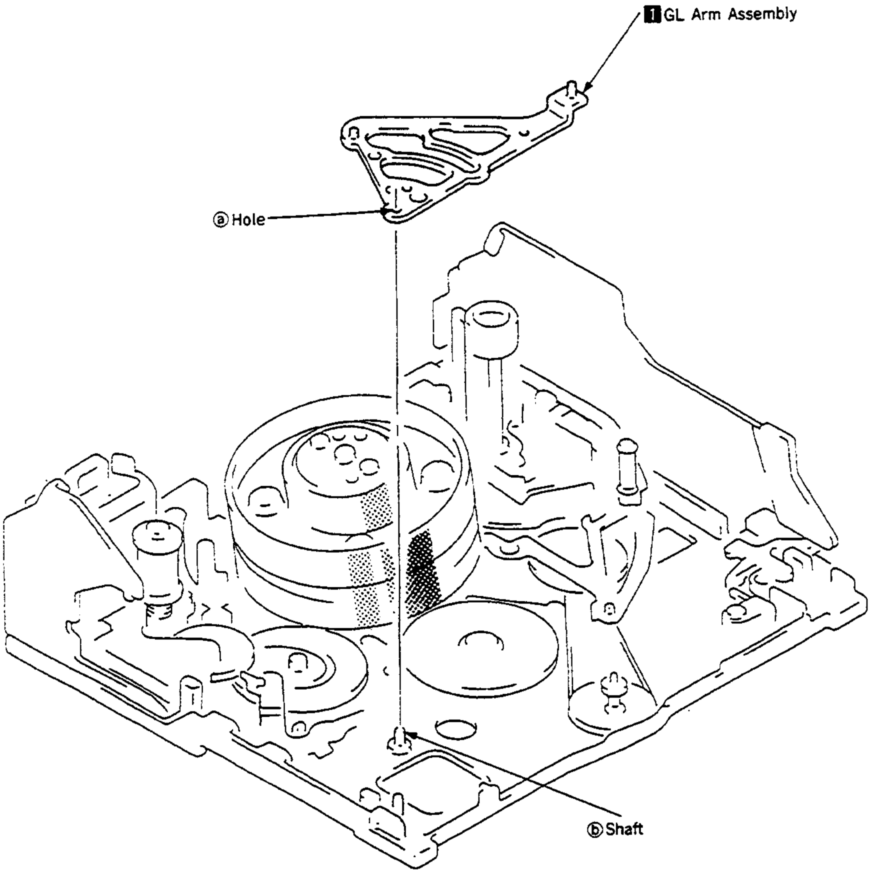


Fig. 26

9. L GEAR A AND L GEAR B (Fig. 27)

Removal

Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly ❶.
10) Remove the L gear A ❷.
11) Remove the L gear B ❸.

2. Mounting

1) Insert the L gear B ❸ into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A ❷ into the shaft of mechanical chassis.
3) Mount the FF arm assembly ❶ with its two shafts inserted into the cam groove of L gear B ❸ and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

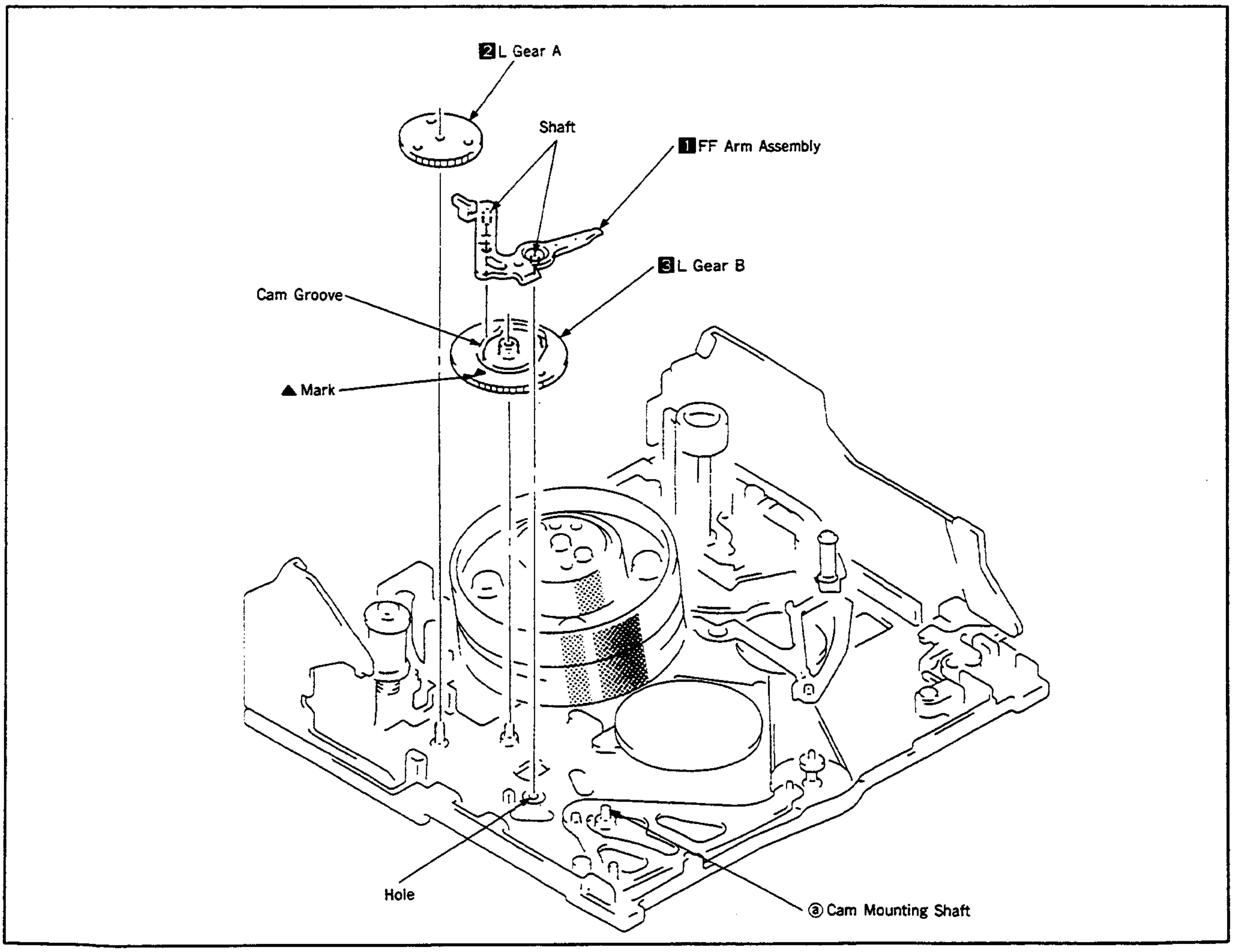


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11) Remove a lock washer 1, then remove together the Change gear assembly 2, relay belt 3 and relay pulley 4.

2. Mounting

*Give one or two drips of oil to the conversion gear shaft and relay pulley shaft respectively. (Oiling range is under the neck as shown in Fig. a.)

1) Hooking the relay belt 3 to the relay pulley 4 and Change gear assembly 2, mount respective parts.

*At first, insert the relay pulley into the mechanical chassis-shaft, then the change gear assembly by engaging with the capstan motor gear.

Note : Take care not to damage the Change gear by the capstan motor gear.

2) Mount a lock washer 1.
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly.
12) Referring to 1-1, mount the cassette compartment assembly.

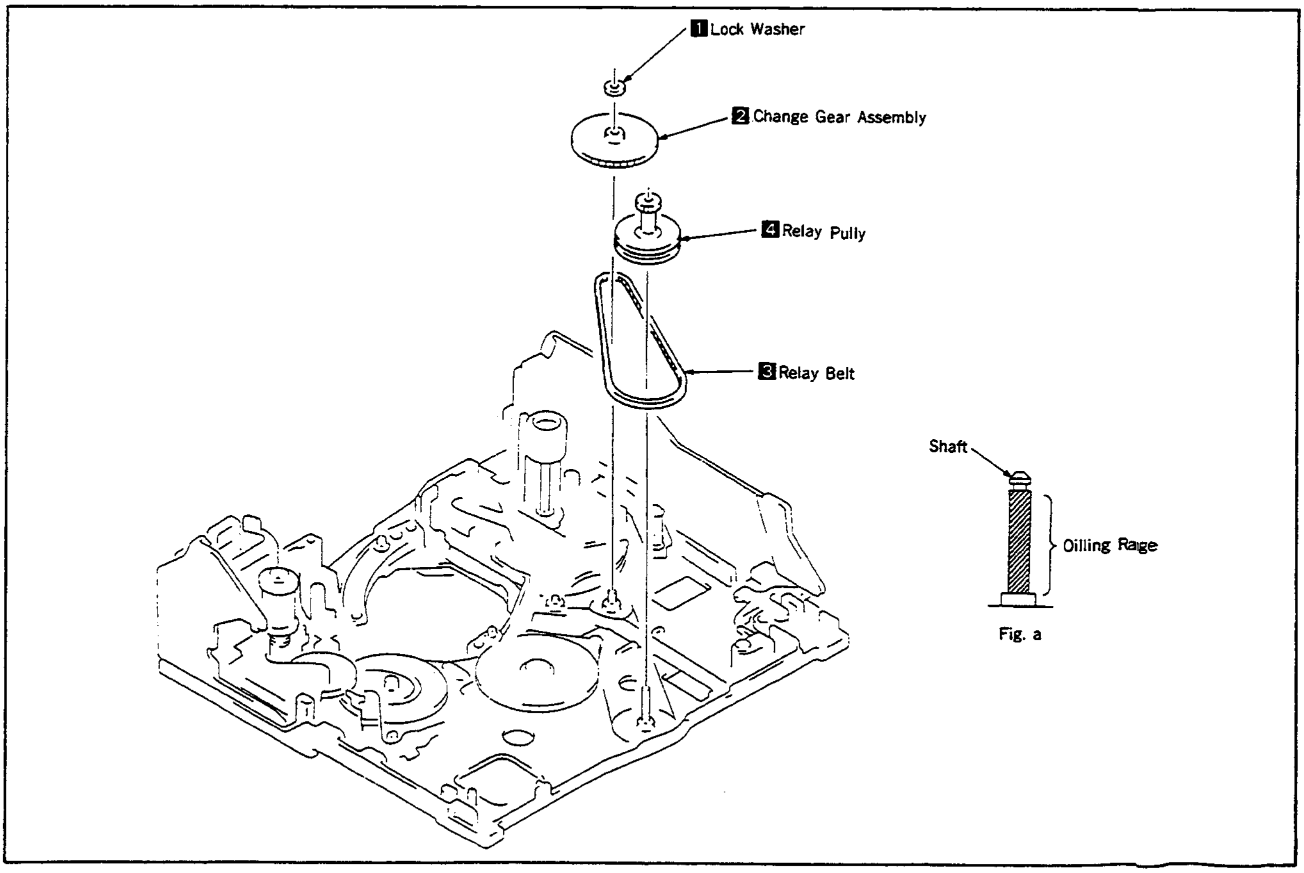


Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

- If possible, make a recording before removal.

1) Remove the two screws ❶ (Fig. 29).
2) Mount the jig ❷ (Ref. No. J-10) with the two supplied screws ❸, then screw the attached hexagon socket screws ❹ to the jig ❷. The rotary upper drum ❺ will move upward and come off (Fig. 30).

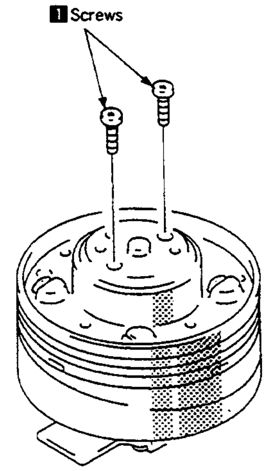


Fig. 29

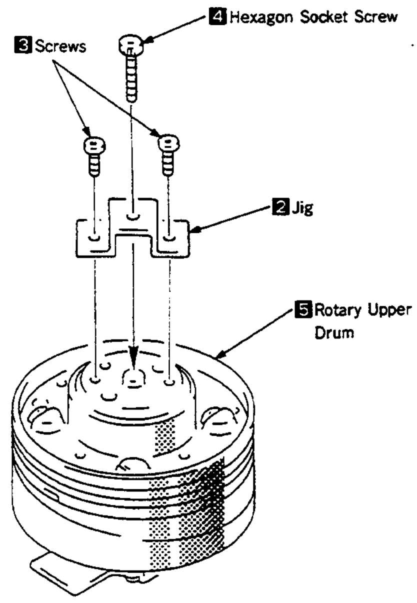


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ❺ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ❻ (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum ❺ by passing the jig through its positioning hole ❼. (Fig.31)
3) Remove the jig ❻ and push down the rotary upper drum ❺ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws ❶ alternately (Fig.29).
4) Insert the jig ❻ into the positioning hole ❼ again and confirm that it goes in smoothly. If it does not, loosen the two screws ❶, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws ❶.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

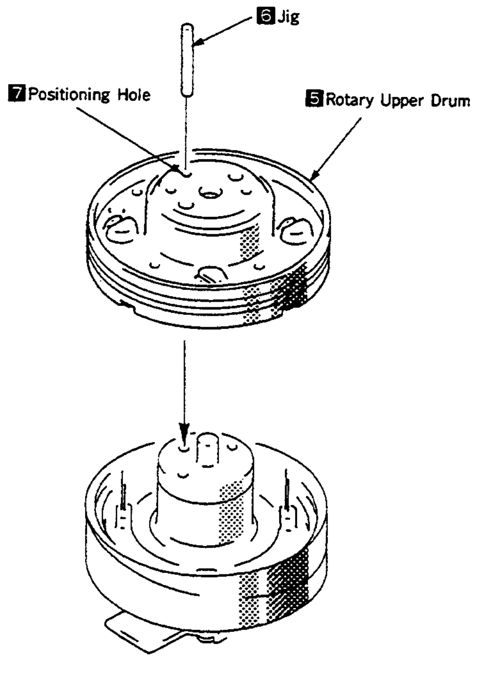


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw **1**.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw **1**.

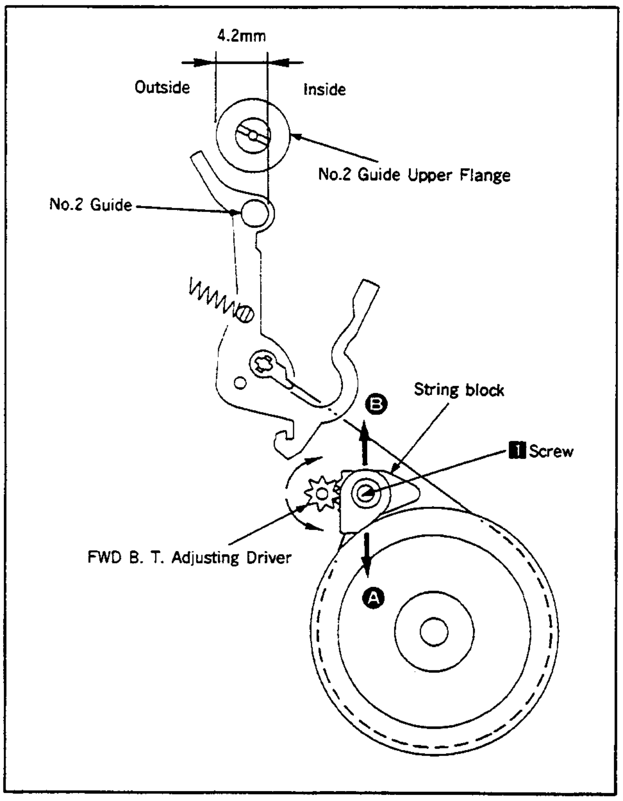

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
String block
B
1 Screw
FWD B. T. Adjusting Driver
A

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
   If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

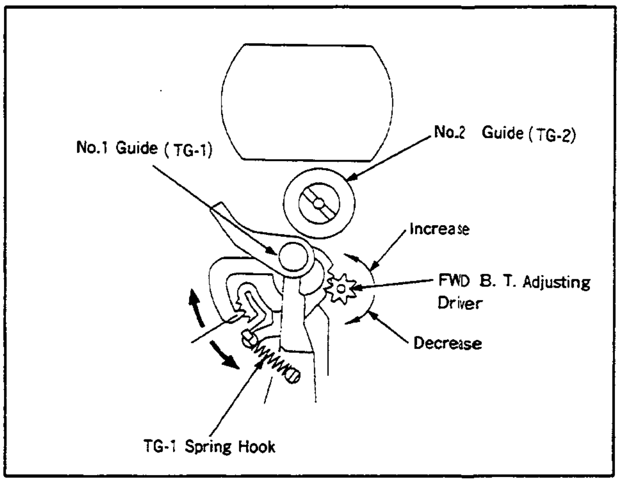

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuation center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T reel table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series
Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode
If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

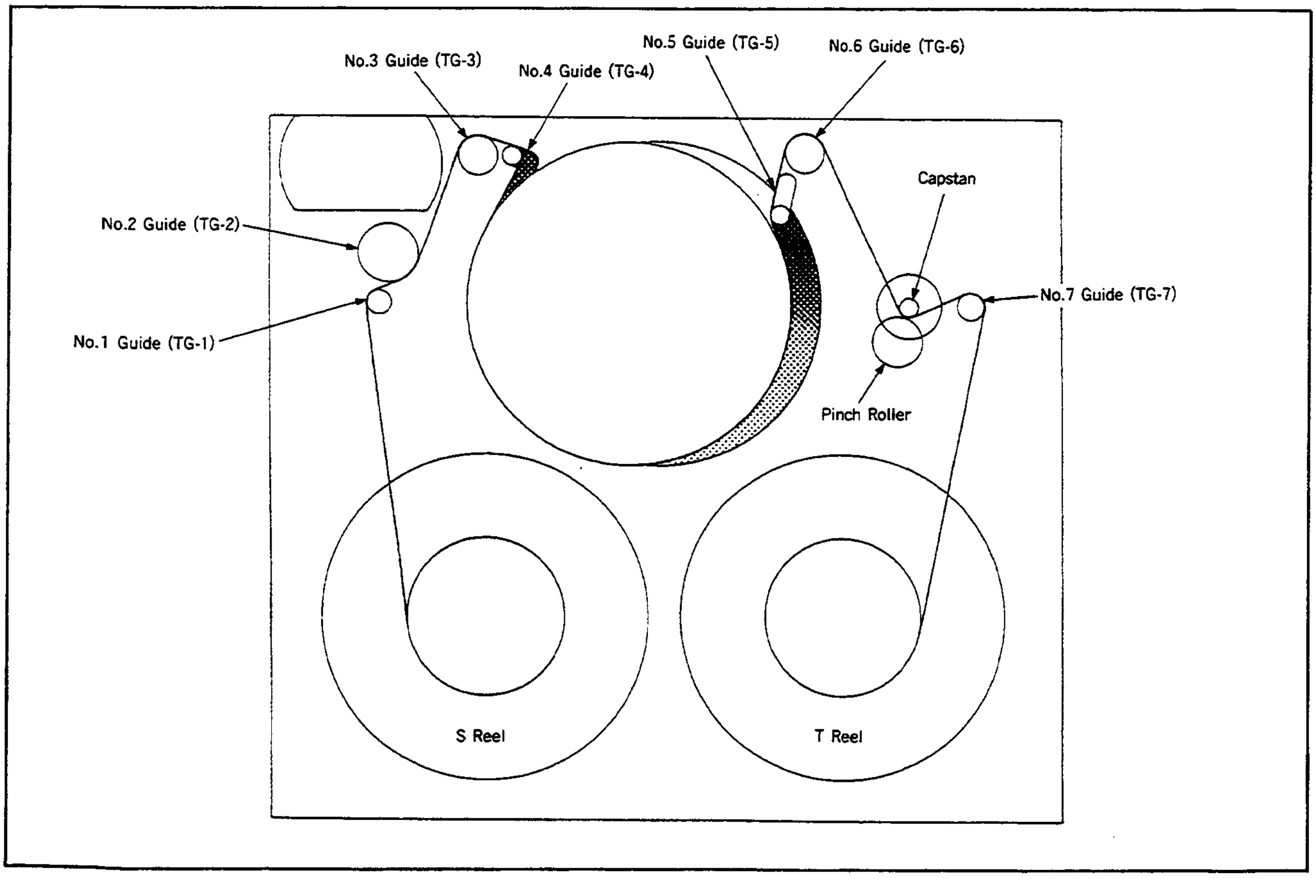


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).
Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

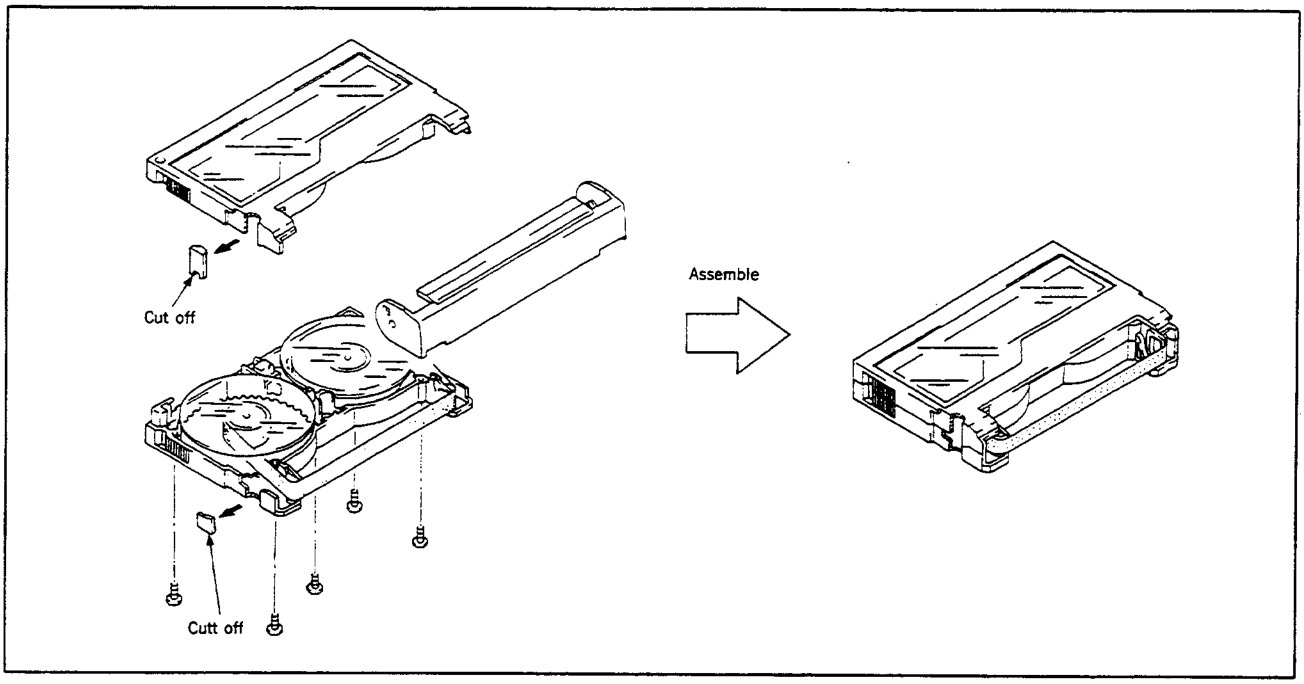


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
   CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
   CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

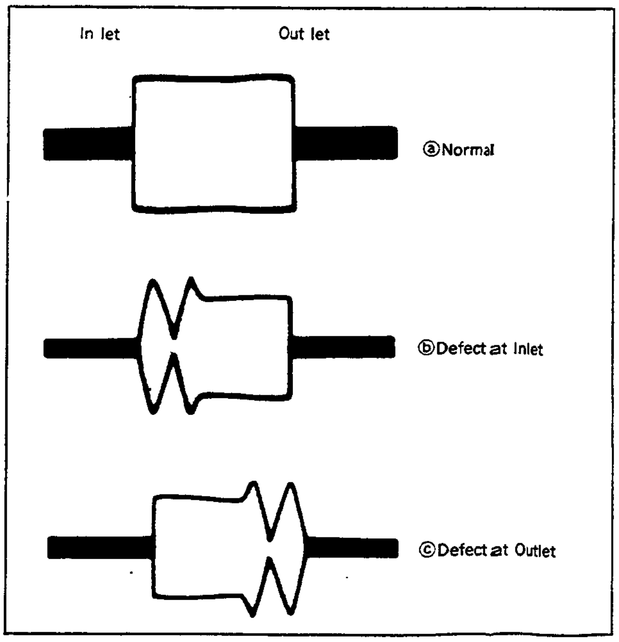


Fig. 35

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw ❶ and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw ❶ to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw ❷ and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw ❷ to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.
: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

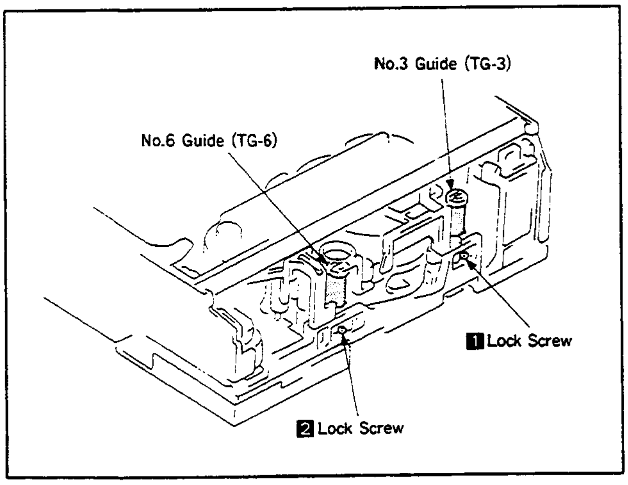


Fig. 36

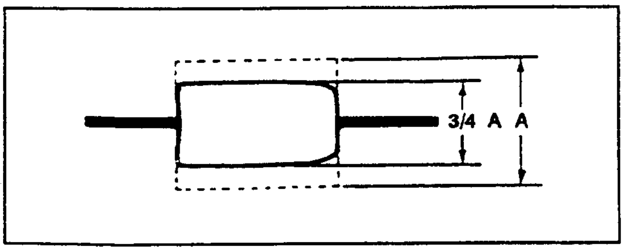


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 38)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

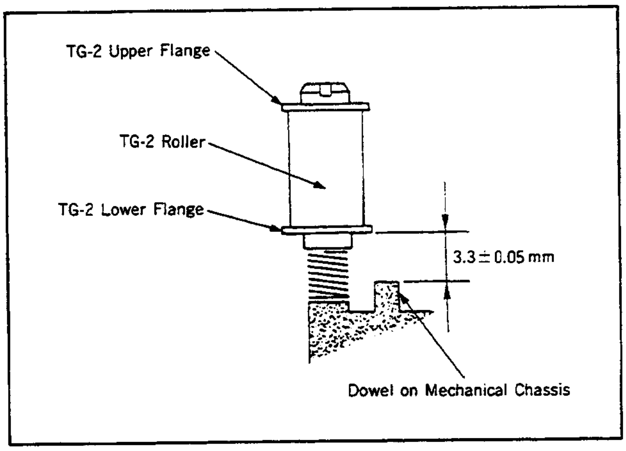


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No.2 guide (TG-2) ❶ (Fig. 39). If it is, turn the upper flange ❸ of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

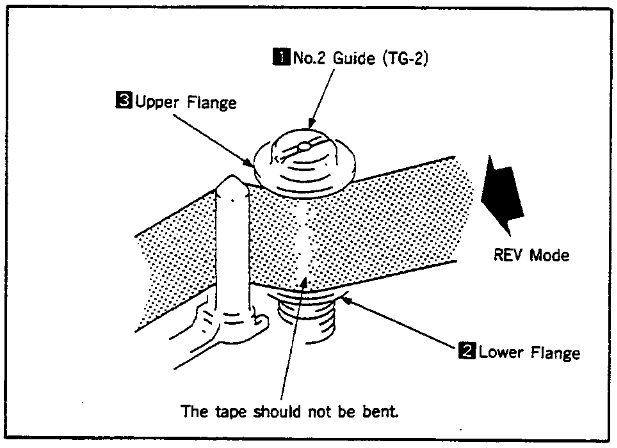


Fig. 39

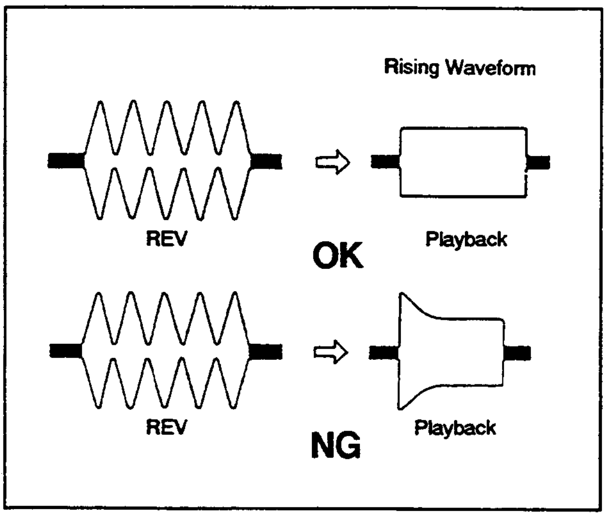


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) ❶ and the capstan ❷. If it is, turn the hight adjusting screw ❹ of the No.7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) ❸ until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3mm or less, adjustment can be considered completed.

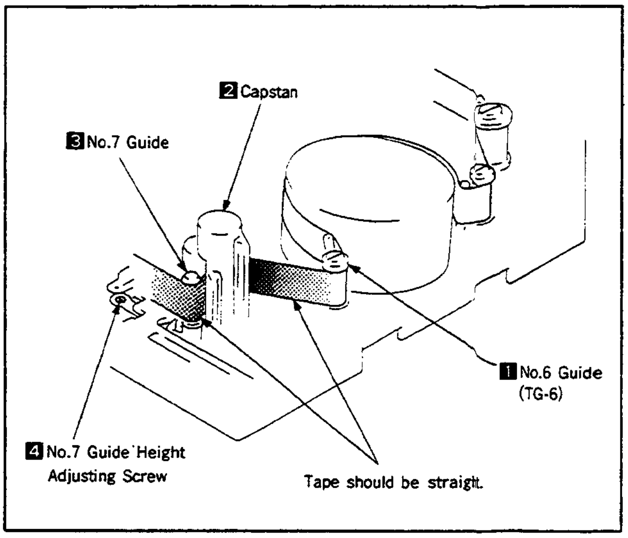


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig.42).
   Otherwise, perform section 4-2 Tracking Fine Adjustment.

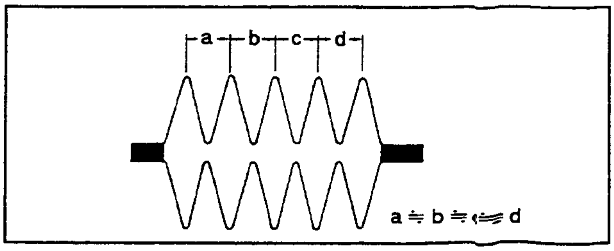


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (EMIN) is 65 % of the maximum value (EMAX) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

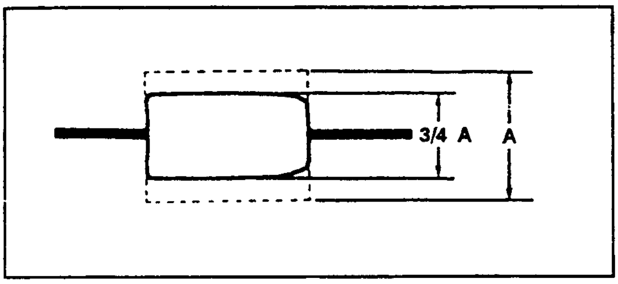


Fig. 43

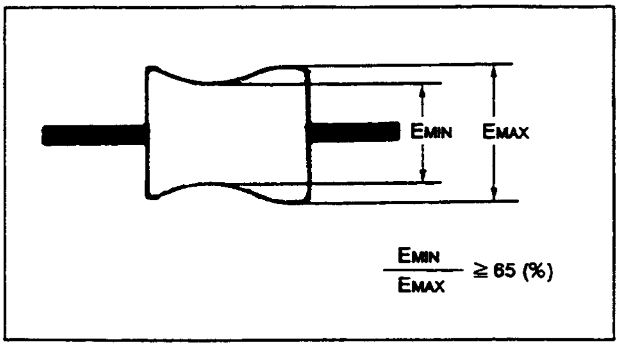

EMIN
EMAX
EMIN / EMAX ≧ 65 (%)

Fig. 44

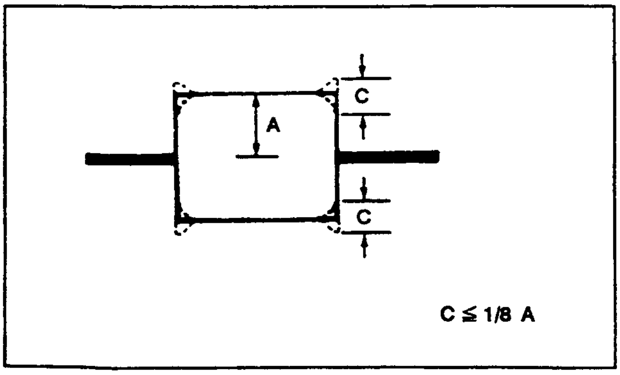


Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

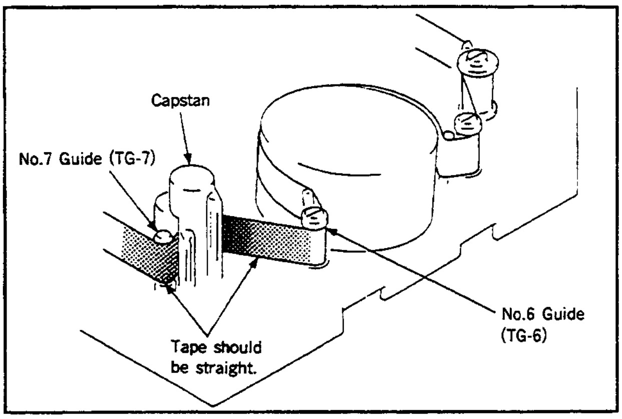

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

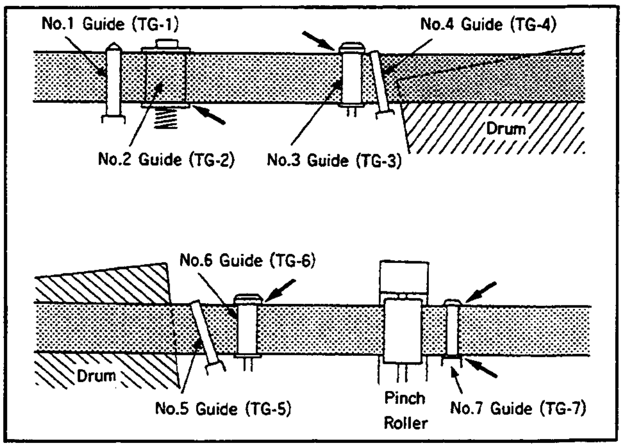

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47

8mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM

SUPPLIMENT-2

Video 8

⟨Connection of Mode Selector IV Conversion Connector⟩

In use of Mode selector IV conversion connector(J-6082-167-A), there are two different connecting methods depending on the model connected:

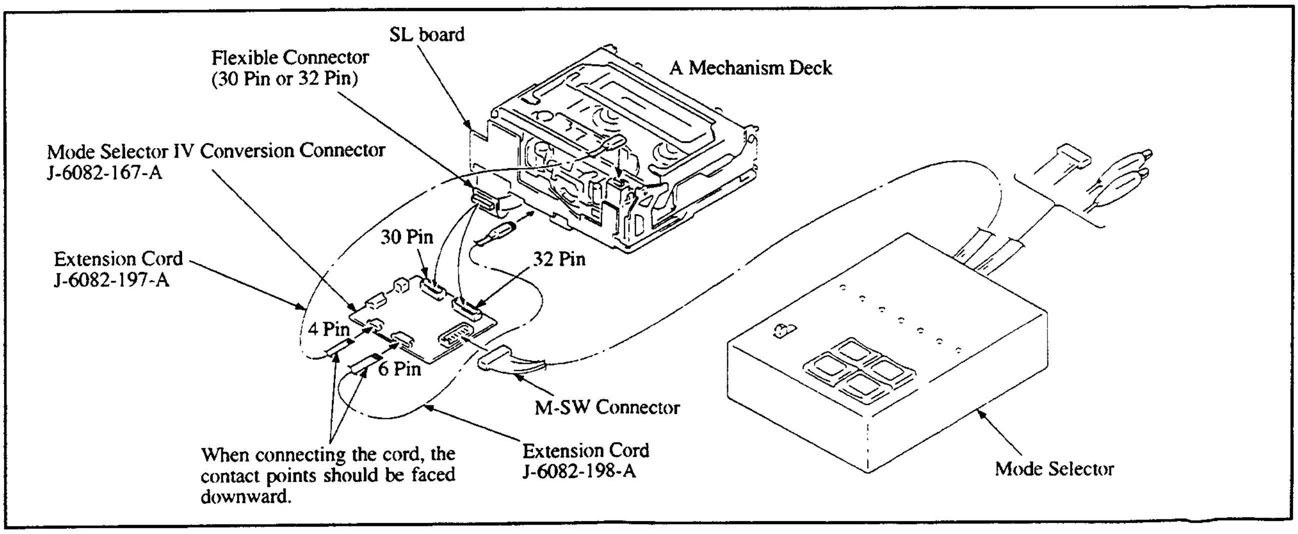
1. CCD-FX series

With the SL board mounted on mechanical deck, connect 30-pin(or 32-pin) connector to 30-pin(or 32-pin) Mode selector IV conversion connector.

CCD-FX300 series, FX400 series. FX500 series
→ 30-pin connector (FP425 or FP600)
CCD-FX700 series → 32-pin connector (FP477)

2. Models other than above

Connect the extension cord(J-6082-197-A) to loading motor 4-pin connector and extension cord (J-6082-198-A) to mode switch 6-pin connector in mechanical deck, then connect the other end of cord to 4-pin and 6-pin connectors of Mode selector IV conversion connector respectively, as shown below.


SL board
Flexible Connector
(30 Pin or 32 Pin)
A Mechanism Deck
Mode Selector IV Conversion Connector
J-6082-167-A
30 Pin
Extension Cord
J-6082-197-A
32 Pin
4 Pin
6 Pin
M-SW Connector
When connecting the cord, the contact points should be faced downward.
Extension Cord
J-6082-198-A
Mode Selector

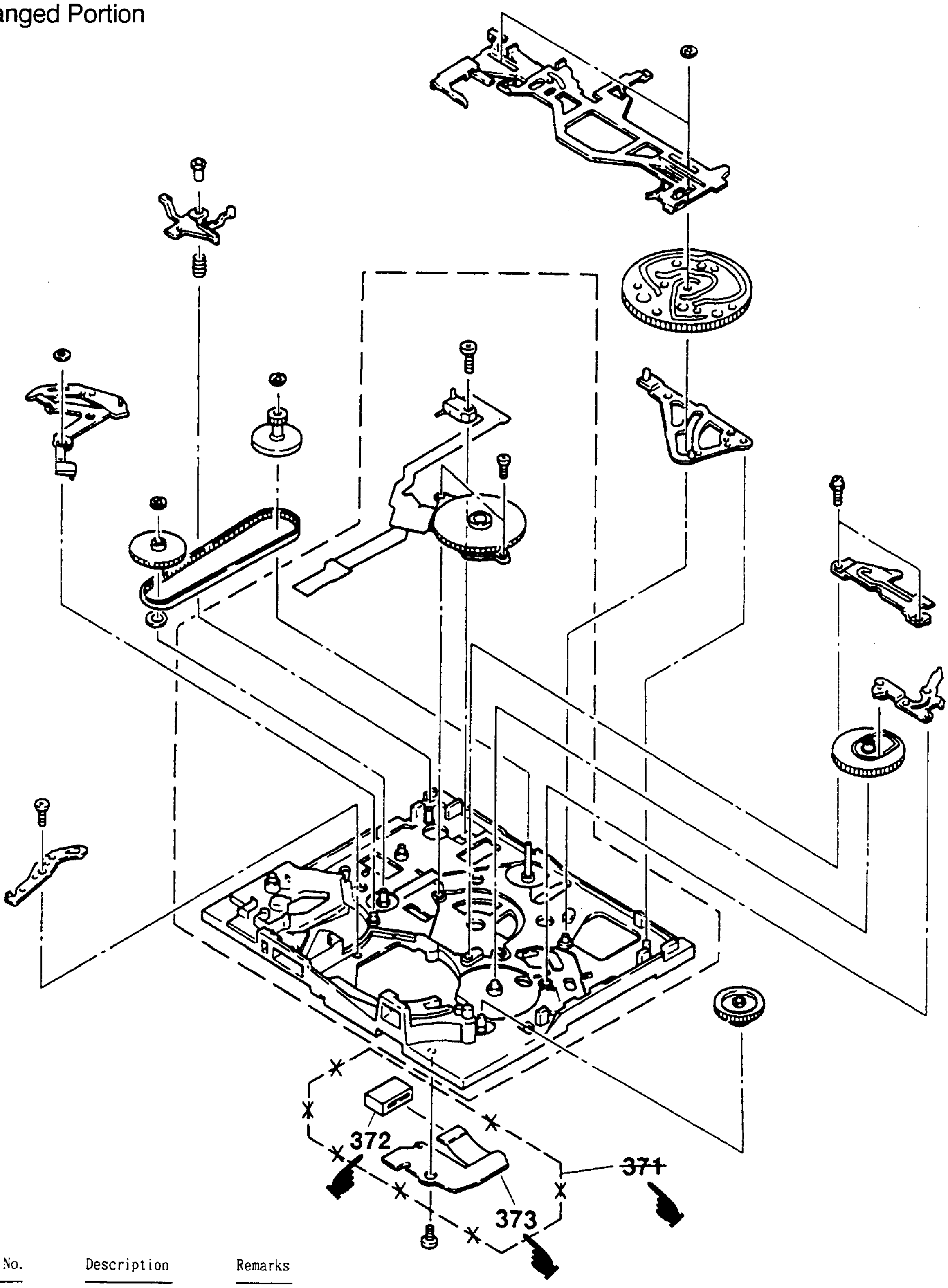
⟨CORRECTION⟩

P10. 2-4 Service jigs list

		Incorrect		Correct
J-15	FWD B.T adjusting driver	J-6082-182-A	➔	J-6082-187-A

MECHANISM CHASSIS ASSEMBLY (2)

☛ : Changed Portion



Ref.No.	Part No.	Description	Remarks
~~371~~	~~A-7040-311-A~~	~~FP-444 ASSY~~ ☛	
372	1-691-254-13	CONNECTOR, TRANSLATION 10P	☛
373	1-641-639-13	FP-442 FLEXIBLE BOARD ☛	

9-973-199-84

Sony Corporation
Personal Video Group

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